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TRANSACTIONS

OF THE

FIFTEENTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION

HELD IN THE CITY OF NEW YORK

MAY 22, 23, AND 24

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TRANSACTIONS

OF THE

FIFTEENTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION,

HELD IN THE CITY OF NEW YORK, MAY 22, 23, AND 24, 1893.

ADDRESS OF THE PRESIDENT.

By MORRIS J. ASCH, M. D.

Fellows of the American Laryngological Association: It is my duty first to thank you for the honor you have conferred upon me by electing me to the presidency of this association—an honor enhanced in value when I remember those who have preceded me in this chair; and, secondly, to bid you welcome once more to this city, where the American Laryngological Association held its first meeting on June 10, 1879; where, in October, 1873, the New York Laryngological Society was formed for the study of the larynx, pharynx, and adjacent parts—the first society formed for the purpose in any country, and from which our own association has been the natural outcome. Those of you here to-day who were present at that meeting will recall the enthusiasm of our first president, his words of counsel, and his prophecies of the future of laryngology. Were he here with us to-day, how more than satisfied would he be with the fulfillment of his hopes, reaching far beyond his most sanguine expectations! In his inaugural address he pleaded for the establishment of professorships of diseases of the throat, for the foundation of special hospitals, and for the addition of departments for the treatment of these diseases in hospitals already established. At the time he spoke there were in all this country but twenty-five teachers of the specialty; of these, but two taught laryngology exclusively; the other twenty-three combined their instruction with

lectures on the diseases of the eye, ear, or chest. To-day laryngology is an intrinsic part of medical education, and the opportunities for its study, clinical and didactic, are universal. This result is largely due in this country to the industry, the genius, and the perseverance of Louis Elsberg, our first president, the pioneer of laryngology in America—its first professor here and the founder of the first clinic for diseases of the throat in the United States and perhaps in the world.

The literature of the specialty was so scanty and so scattered in 1879 that it was suggested that the association, as one of its functions, should prepare a digest of the progress of laryngology, compiled from the publications appertaining to it, and that this digest be supplied to the fellows and to outside subscribers. To-day not only are the special journals in excess of the need, but almost every medical journal, besides publishing articles by laryngologists on laryngology and rhinology, has its report on the progress of the specialty. It must be a source of gratification to the older members to witness the change. The younger specialist of to-day can scarcely appreciate how different are the conditions at present. He can scarcely believe that, even so lately as at the first meeting of this association, the laryngologist was looked upon by the older generation of medical men with a certain amount of distrust. The laryngoscope was considered a sort of physiological plaything, and I well remember the amused incredulity shown by one of our prominent medical men when he was told that tubercular laryngitis could be diagnosticated by it prior to any pulmonary manifestations. That to-day the study of these diseases is universal, and knowledge of the laryngoscope part of the training of every American physician, is, I sincerely believe, due in this country to the influence of the members of this association, who have conscientiously upheld its importance and have given it dignity by the conscientiousness of their work and the value of their researches.

At the time the association was formed it was the belief of some of its founders that its members should be drawn only from those who directed themselves wholly to the study and practice of the specialty, but it was not meant that the laryngologist should be only a laryngologist, or that the specialist should be disassociated from general medical science; no one knew better than these men that to be a good laryngologist it was necessary to be thoroughly trained in every department of medicine, and that not theoretically, but practically; but it was deemed wisest, in the inception of the asso-

ciation, that its majority should be composed of those who were prominent in the specialty, and thereby give it importance in the eyes of the rest of the medical world. For myself, I am fully in accord with the advice of Mackenzie to the younger members of the British Laryngological Society that, while devoting themselves to their specialty, they should continue to practice general medicine and surgery during the first ten years of their career. In his inaugural address at their first meeting in 1888 he says: "It is impossible that a man can be a really good specialist without possessing a general knowledge of disease, and when I say general knowledge I do not mean such a knowledge as can be obtained in a student's career, or even such as can be acquired by the holding of minor appointments at the termination of a hospital curriculum; what I consider requisite is such a familiarity with morbid processes as can only be acquired by those who are in the habit of using all the resources of their art in combating the great varieties of ills which flesh is heir to. In my opinion, only those who have acted as general practitioners for some years, or have held appointments as physicians or surgeons to general hospitals, are thoroughly equipped for practicing as specialists. It is only after thorough knowledge has been obtained in many departments of medicine that training and experience can be focused with advantage on a single point" (Presidential Address delivered at the first meeting of the British Laryngological Society, November 14, 1888).

These words of the great master are most true, and I commend them to you when you are called on to advise a young graduate in his selection of a career.

Much that was pointed out at our first meeting as being needed has been accomplished. The plea for systematic teaching has been heard, and in all the post-graduate schools and in the medical colleges of this country laryngology finds itself the equal of any of our sister specialties. Am I claiming too much for this association when I say that to the men who formed it fourteen years ago this result is largely due? The advance in our knowledge of the pathology and therapeutics of diseases of the throat and nose since that time is known to you all. Very crude, comparatively, were the appliances and methods of that time. The galvano-cautery was an uncertain agent. How many of us beginning an operation with it had to complete it by some other procedure? The electric light was a thing unknown, and the application of the electric motor to nasal surgery had not been foreshadowed. Laryngeal tuberculosis was

an incurable disease. Krause and Heryng had not yet given the results of their labors to the world, and the removal of the larynx was an operation that made the boldest of us shudder. Our armamentarium was limited in comparison with the instruments we now possess: a Mackenzie's lamp and reflector; laryngeal and pharyngeal mirrors; a set of forceps—Mackenzie, or some other pattern; Schrötter's tubes; Storck's guillotine, some brushes, and applicators; a powder blower, with a number of extraordinary instruments, usually the invention of the specialist himself—and utterly useless in the hands of any one else—constituted our working capital. What we possess to-day of appliances and instruments I need not detail to you. Every day brings forth something new, either in the form of an instrument, some new pathological fact, or some method of relief or cure. That all of these will prove to be valuable I do not assume, but out of the vast mass which is being heaped up by the faithful workers something will surely be extracted that will bring honor to its author and relief to mankind. The study of the physiology and diseases of the anterior and posterior nasal passages and their accessory cavities has given us most valuable results, and so closely has their relation been traced to diseases of the ear that now the treatment of these last diseases is coming within the domain of the laryngologist. The ophthalmologist invokes his aid also in diagnosticating and treating the catarrhal affections of the eye. To one of our own fellows, too early called away from the theater of his labors, Dr. Hooper, of Boston, a great part of this is due.

If, then, in fourteen years so great an advance has been made, it is not too much to expect that in the near future the value of our work will be increased, and the result of the labors of this association will give added knowledge to the world in every branch of our specialty. I speak advisedly when I say the labors of this association, for I believe that most valuable work is being done by it, and the incentive of our annual meeting elicits in its papers the results of faithful observation and laborious research, while their discussion is sure to bring forth opinions and facts from the members which their large clinical experience renders most valuable.

It is a matter of congratulation that our association is so largely composed of those who, by their position as teachers or at the head of extensive clinics, are so thoroughly competent to pass judgment. While, then, we look forward with anticipation to the work yet to be done, and encourage the ardor of those who, zealous in their task

and prominent by their success, are still foremost in the pursuit of knowledge, we must also halt to mourn the loss of one who has fallen by the way, in the vigor of youth and in all the glory of his intellect. Such a loss has befallen us in the death of our late associate, Dr. Franklin H. Hooper. Although still young, he had made his mark as a faithful and able investigator. Thoroughly trained in the laboratory of Harvard, he brought to his work, with the capacity developed by a thorough education, the desire to utilize to the fullest degree the advantages he enjoyed. When we were last year in Boston his absence from our gathering was a disappointment to us all, for all missed the eloquent learning which would have illuminated our discussions, the zeal with which he would have defended his opinions, and the gentle courtesy which would have added grace to our social intermissions. His scientific work is known to all here. His labor in demonstrating the relation of adenoid hypertrophy to ear diseases was at once appreciated by the medical profession, and was the means of bringing into general notice the operation for its removal which has since become so universal. Such a void as the death of Dr. Hooper causes is difficult to fill; and it is fitting that at this meeting, the first held by the association since his death, it should cause to be placed in its *Transactions* its appreciation of his merits and its sincere regret at his early demise.

At its present meeting the association will be called upon to take action on certain amendments to the Constitution and By-laws, of which notice has been given by the secretary, and it will also decide in what manner it will utilize the time allotted to it at the coming Congress of American Physicians and Surgeons at Washington in 1894. It has been decided by the executive committee of this body that an hour and a half of each session shall at its next meeting be occupied by one of the participating organizations, and that each society selected to perform this duty shall prepare its own programme for the period assigned to it by the committee, and select its own speakers. You will decide in what way this time shall be occupied: whether by the reading of papers or by a discussion on some question of interest to the general profession as well as to the specialist; and you will also indicate whom you elect to represent you on this occasion.

Now, gentlemen, as the time of our session is limited, and as there are several papers of interest on the programme for to-day, I will not detain you longer, but bid you God-speed in your work.

Knowing what we have already accomplished, I confidently trust to the members of this body to continue their labors for the advancement of our specialty in the future as faithfully as in the past. As teachers, as workers in the difficult path we have chosen, and as worthy upholders of the dignity of our task, each and every one of you will reflect credit on the profession. It is with no desire to magnify the importance of this association if I say that to its labors I believe is largely due the practical advancement that has been made in late years in the treatment of diseases of the throat and nose. That it will continue to do so in the future I sincerely trust. The older fellows have nearly fulfilled their allotted tasks; on the younger members will devolve the honor of continuing the good work that has been begun, and we know that our standard will be borne right manfully.

If I might be permitted to give a word of counsel in the capacity in which I stand before you to-day, I would urge the importance not only of studying but of teaching our art. There is no incentive to acquire knowledge equal to that of imparting it. It will keep you in the front rank, for to disseminate it is necessary to possess, and one must always be abreast of the progress of the day in order to honestly satisfy the requirements of the student. An Eastern sage once said: "Much have I learned from my teachers, more from myself, and most of all from my scholars." Take the lesson to yourselves, and in its fulfillment you will find the reward of your work.

Paper.

A CASE OF COMPLETE GLOTTIC SPASM IN AN ADULT, FOLLOWED BY UNCONSCIOUSNESS AND PROLONGED DROWSINESS.

By W. PEYRE PORCHER, M. D.

As I have been able to find records of only twenty-seven cases of laryngeal vertigo or complete glottic spasm in adults, and on account of marked implication of the brain centers as shown by torpidity of bowels, persistent drowsiness, and other symptoms, which are novel, at least to the writer, I have ventured to make the following brief report of this case:

The patient was a maiden lady, aged fifty-two years, at the menopause. She was brought to my office for the supposed removal of large tonsils on account of difficult respiration at night, with frequent terrify-

ing nightmares. She attributed this condition to an attack of grip which she had had several months before.

Since that time the paroxysm had not been severe, but her attendants stated that she would be awakened by the cough after dropping to sleep, and it was described by her as a feeling of choking or gagging in the throat. There was no dyscrasia, except such as resulted from a slight malarial cachexia. She was of a very sanguine temperament, inclined to plethora, and so nervous that she expressed the greatest alarm when requested to enter my dark room. She could not go into a church or other crowded place without a sense of fear and oppression.

On examination, her tonsils were found to be so small that they could not be caught in the grasp of either of two improved amygdalotomes. They were, therefore, thoroughly cauterized with the galvano-caustic knife.

She was ordered a simple antiseptic gargle of listerine and water, and cautioned against taking any hot food, coffee, etc.

The first night after the operation she had no great pain or unusual difficulty of breathing. The next morning she attempted to drink some coffee which she said was not hot. Upon taking the first teaspoonful she complained of a peculiar giddiness and rushed to the window for air, but fell back upon the floor unconscious. The attack lasted but a short time. On my arrival soon after, she had entirely regained consciousness and was comfortable. As her attendants stated that she was very drowsy, ten grains each of calomel and soda were ordered to be taken at once. At the evening visit it was found that the medicine had not acted, and the next morning there had been but one slight evacuation. This, together with the persistent drowsiness which lasted for several weeks, indicated that there was marked implication of the brain centers, although there had been no return of the attacks of insensibility.

She was ordered sulphate of strychnine, one twentieth of a grain, with one grain each of quinine and iron. This dose was gradually increased until one tenth of a grain of strychnine was taken three times daily. Small doses of a saline cathartic were also given from time to time in order to keep the bowels open.

About thirteen days after the first cauterization, the left tonsil remaining still somewhat enlarged, a second application of the galvanic electrode was made to it. This was followed by most satisfactory results. She informed me that her rest the night following had been very refreshing, without difficult respiration, pain, or nightmares.

The patient was kept under observation for about fifteen days longer. At the end of this time she expressed herself as having regained control of her nerves, and considered herself well.

On account of the well-known tendency of hot coffee to enter the larynx, and for the reason that I know of no other cause to which to attribute the sudden attack of insensibility, as there was

no paralysis present, I have been inclined to regard this as a case of laryngeal vertigo or complete glottic spasm, and have so entitled it. It might be thought that the vertigo was in some way due to the menopause, but this would not account either for the prolonged stupor or the torpidity of the bowels. Cases of laryngeal vertigo have been reported in which cough has either been absent or not of any great severity, and others in which the nervous element was most prominent, but in which there were no attacks of absolute insensibility, and again other cases in which very slight paroxysms of cough would be followed by complete unconsciousness. The insensibility with slight cough, as in this instance, is perhaps best explained by the theory of McBride that the attack was preceded by a series of short inspirations followed by spasmodic expiration and a partially closed glottis. Here, also, the patient was not even aware that any coffee had actually entered the larynx, but was seized with a sudden gasping for breath, and after rushing to the window fell unconscious, as she said, "in a heap upon the floor." It is the opinion of the writer that this loss of consciousness, like aural vertigo, is a symptom of a specific disease, and should not be confused with that vertigo which results from holding the breath for a sufficient length of time, or even that which results from a severe paroxysm of cough or sneezing. It should not, in any respect, be regarded as an epilepsy, as there was never any spasm or jerking of any description at the incipiency or at any time during the attack.

Discussion.

Dr. F. I. Knight, of Boston: I am very much interested in cases like the one related by Dr. Porcher. Some time ago I reported a case and collated others in which there was loss of consciousness after prolonged fits of coughing, and it seemed to me that they were due to a disturbance of the cerebral circulation caused by the coughing. Dr. Porcher does not admit that in his case the loss of consciousness was due to disturbance of the cerebral circulation, and I am inclined to agree with him. I really think it belongs to a different class of cases, and one of which we have not yet got the proper explanation. These cases are of such rare occurrence that a sufficient number of them have not yet been collated to form any definite opinion regarding them.

Dr. J. Wright, of Brooklyn: These cases, I think, must be very rare indeed. I am not aware of more than half a dozen of them on record. While a hospital interne I saw one of them. The case was brought into the hospital unconscious. The patient was gasping for breath and trache-

otomy was rapidly done and artificial respiration maintained. Stimulants were injected and the patient made a tedious recovery. She never had another attack, but has had many sudden attacks of aphonia since, probably due to spasm of the abductors, while her serious attack was evidently due to spasm of the adductors. The case was one of hysteria. If we reject the theory of Krause we must suppose a functional paralysis of the abductors in the first attack and of the adductors in later attacks.

Dr. J. W. Gleitsmann, of New York: I have collected the literature on this subject and reported a case about two years ago. Altogether I have collected about seventeen or eighteen cases. The case I reported was under my observation several years ago. It was one of laryngeal vertigo produced by coughing in consequence of enlargement of the lingual tonsil. The case was treated in the usual manner, the lingual tonsil being repeatedly cauterized. The patient improved remarkably and was cured after four or five applications. He is now a strong, healthy man, weighing about two hundred pounds. The attacks of vertigo caused almost complete unconsciousness and in one of them he fell and injured himself. Hypertrophy of the lingual tonsil was the only morbid condition I could find; this produced the fit of coughing, which was followed by laryngeal vertigo.

Dr. W. E. Casselberry, of Chicago: I recall in this connection two quite interesting cases, which, however, do not correspond exactly with the case that has been related to us by Dr. Porcher. It seems to me that one can divide these cases into different classes, having a certain relationship to each other. First, for instance, cases of reflex spasm of the glottis, to which children are predisposed by the presence of acute laryngitis, but which are oftentimes excited reflexly by irritation of the faucial tonsils, the naso-pharyngeal tonsil, or nasal disease. Closely related conditions may extend into adolescence, an interesting example of which was a girl about fifteen years old, who had enlargement of the faucial tonsils and of the nasopharyngeal adenoid tissue. In this patient I was able on two occasions to produce typical attacks of laryngeal spasm. She sought relief from such attacks, which would occur spontaneously with frequency and would at times culminate in momentary unconsciousness apparently caused by asphyxia and not by a genuine vertigo. The first experimental seizure I produced accidentally by means of a strong naso-pharyngeal spray, reflex laryngeal spasm supervening instantly, the stridulous inspiration and asphyxia lasting about half a minute. The following day, for purposes of investigation, I passed a probe behind the velum and caused it to impinge on the adenoid mass, and she passed again into a violent attack of laryngeal spasm, with unconsciousness, and I was hastily getting out my tracheotomy instruments when she recovered. The attack was so alarming that I discontinued my experimental efforts. The removal of this adenoid mass was possible under cocaine, and complete recovery followed.

In another class of cases there is an attack of vertigo—if we choose to

call it so—with absolute unconsciousness and with a slight twitching of the muscles; this is closely related to epilepsy. Such a case recently came under my observation. There was enormous hypertrophy of the turbinated bodies from the anterior to the posterior ends, without material enlargement of the tonsils. This patient had never suffered from epilepsy until recently, having reached the age of thirty-eight years, when she began to have attacks of glottic spasm with unconsciousness.

We have, therefore, on one hand, the ordinary cases of spasm of the glottis which we may call reflex. Then, closely associated with this, we have spasm of the glottis with epileptoid movements or *petit mal*, and then again we have the true laryngeal vertigo, with spasm of the glottis and unconsciousness, without epileptoid movements.

I usually attribute these cases to reflex irritation, most frequently arising from the faucial tonsils, the naso-pharynx, or the nasal space. I believe if the nasal tract and other structures are put in thoroughly healthy condition, or as near as possible to it, it affords the best treatment for these phenomena.

Dr. J. N. Mackenzie, of Baltimore: I should like to ask whether there were present in Dr. Porcher's case any marked symptoms of a central lesion of the nervous system. It seems to me that we must fall back on a central cause for a full explanation of these cases.

Dr. S. W. Langmaid, of Boston: I should like to say a few words about the diathesis in these cases of laryngeal vertigo. The reflex may proceed from some portion of the digestive tract. So far as my own small experience goes, I should say that that was the common cause. Undoubtedly there are cases in which the reflex is excited by conditions in the naso-pharynx or the upper respiratory tract, but such have not come under my observation. My experience has been that the laryngeal spasm, both in children and in adults, has arisen from some digestive trouble; this is more especially true in adults. I do not know of a surer way of preventing what was formerly called "false croup" in children than by clearing out the intestines. In many such cases it will be found that the children are subject to intestinal trouble or constipation. When I was in general practice I frequently prevented night calls by instituting a course of treatment directed to the digestive tract, thus successfully preventing the recurrence of croup. Several cases have been reported in local journals of laryngeal spasm in adults, and I have always been able to find that such phenomena occurred in gouty individuals.

Dr. John O. Roe, of Rochester: There is one point in the discussion on this subject that has been overlooked, and that is the irritability and sensitiveness of the larynx itself as a cause of laryngeal spasm. In fact, I have come to consider a sensitive condition of the larynx as the predisposing or exciting cause in all cases of laryngeal spasm, and to believe, as Elsberg observed in a paper read before this society in 1884 on Laryngeal Spasm, that "most of the cases of the heretofore so-called 'laryngeal

vertigo' are cases of inspiratory, some of them of deglutitory, adductor spasm."

I have observed cases of both inspiratory and deglutitory spasm of the larynx attended by vertigo. In one case of the latter the patient, a lady of neurotic temperament, was so reduced from inability to take food that she could hardly walk. On attempting to swallow any substance, especially solid food, she would have violent laryngeal spasm, and when I first saw her these attacks were frequently so severe that she could only swallow liquid food which had been strained clear of solid particles. In experimenting with her in regard to the production of the spasm, I found that by touching the larynx lightly with a probe, laryngeal spasm would at once be induced. There was an inflammatory condition about the arytænoids, which was cured, and the laryngeal spasm was entirely relieved by treatment directed to the larynx. A similar case came under my observation a few days ago, in which solid food could not be swallowed without inducing spasm of the larynx, due entirely to irritation about the arytænoids. I have also seen cases of violent laryngeal spasm from nasal irritation. In one case a man had in his nose a neuroma which, if he attempted to pick his nose, produced a violent laryngeal spasm.

Dr. Porcher: I feel much gratified that the case reported in my paper has elicited such an exhaustive discussion, particularly as I find the literature on this subject is extremely scanty. There have been so many points brought up that it is almost impossible to comment on each one of them. In my thesis to this association I described a case of spasm of the windpipe. The spasm would apparently be complete, the patient would turn blue in the face and remain so for a few seconds, and then regain control of her breathing. There was no unconsciousness following the attacks, but they were usually preceded by violent paroxysms of cough.

The case referred to in my paper to-day I reported chiefly on account of the unconsciousness and the prolonged drowsiness and torpidity of bowels, which proved to my mind that there was brain implication. I think that Dr. Knight and Dr. Mackenzie have touched the keynote when they attribute the disease to a central lesion. So far as the performance of tracheotomy was concerned, I did not find it necessary to do it. In the case of spasm of the larynx above referred to and published in the *Journal of the American Medical Association* * the spasm could be brought on with the utmost ease by titillating the posterior pharynx. In accordance with the recommendations of Dr. Lennox Browne, who advises that the treatment should be directed to the pharynx rather than to the larynx, I applied mild solutions of silver nitrate to the posterior pharyngeal wall, and succeeded in gaining such control over it that the spasms did not return. The only case similar to mine, excepting that there was no history of prolonged drowsiness, was the one reported by Dr. Gleitsmann. Dr. Casselberry reported a case in which the spasms were brought on by

* See *Journal of the Am. Med. Assoc.*, vol. xx, Mar. 18, 1893.

spraying the throat. I could in my case perhaps have induced the spasms in the same way. My impression is that the exciting cause of the spasm was the introduction of the coffee into the larynx. I am not perfectly certain of that, however; it is simply my impression.

The attacks did not resemble epilepsy, as there was no jerking of the limbs. There was no paralysis of any kind present, nor were there any marked gouty or rheumatic manifestations which I could detect.

Paper.

THE WITHHOLDING OF REPORTS OF OPERATIONS FOR THE RELIEF OF CANCER OF THE THROAT.

By D. BRYSON DELAVAN, M. D.

IT is but too well known by all that the results of the present methods for the treatment of malignant disease of the throat are in the main far from satisfactory. The sole aim of this paper, therefore, will be to urge upon those in whose power it lies the importance of increasing our practical knowledge of the subject by their contributions, and thus enabling us to judge fairly and accurately as to our actual ability to deal with this variety of disease.

In presenting it, the writer at the outset earnestly disclaims either the intention or the desire to reopen the discussion as to the relative merits of any one method of operation compared with another. Still less does he wish to throw discredit upon any method of operation which may have been employed, or to criticise any operator who may at any time, or in any place, have labored in this field of surgery. It has been his misfortune to see a considerable number of cases of cancer of the throat, and to learn from them, and from the recorded experience of others, the painfully well known fact that malignant disease of this locality, no matter of what histological character it may be, is always a most serious affection at the best, and that, occurring in the form of epithelioma, is practically an absolutely fatal one. More than once new methods have been suggested which have seemed to offer a fair prospect of increased success; some of these, in the case of the less malignant forms of growth, have proved to be of decided value. In epithelioma, however, they have generally proved unsuccessful, and the record of such as have been reported is little better than a long and disheartening series of failures. Such indeed it must appear to the patient himself when seeking information upon this subject. The

difficulties in the way of an intelligent prognosis have, up to the present time, seemed almost insurmountable. Of course, it is impossible to judge of the actual result of any series of operations until after the lapse of a considerable amount of time. With cancerous disease this is particularly the case, inasmuch as the very criterion of success of an operation is the extent to which the patient's life has been prolonged by it, and most of the operations which we have under consideration have been proposed too recently to enable us to obtain satisfactory statistics as to the actual prolongation of life which they have accomplished.

To illustrate the difficulty of obtaining accurate statistics, let us take the history of thirty operations upon the larynx in cases of epithelioma, already publicly reported or gained by the writer from private sources. They represent the work of several of the most eminent of living surgeons. Such cases should be divided into three classes: First, those in which the history is complete up to the time of the patient's death. Second, those in which, at the time of the writing of the history, the patient is still living, but suffering from recurrence of the disease. Third, those in which at the date of the history the patient is alive and well.

It is plainly unfair to confine our deductions to the reports of the first class without taking any consideration of classes two and three, as witness the following results:

In the thirty patients operated upon and dead, the aggregate of the length of life was two hundred months, or sixteen years and two thirds; but it is often stated that the average duration of life in cases not operated upon is about eighteen months from the time at which operation would be likely to give promise of some success. In my own experience, by the way, this estimate is too liberal. Assuming it, however, to be approximately correct, the aggregate length of life of thirty patients unoperated upon would be about five hundred and forty months, or forty-five years. Thus it would appear that in these unsuccessful operations there had been lost to the thirty patients no less than twenty-eight years. In so far as the record concerns class 1, this is true. When we come to compare it with collections of cases representing classes 2 and 3, however, it at once shows a wide variance. And yet, until the histories in these classes shall have been completed by the death of each patient, it will be impossible to arrive at any accurate conclusion.

Again, one of the best summaries extant is that of Kraus.* In

* *Allgem. Wiener med. Zeitschr.*, 1891, No. 15.

this he studies together the cases of laryngectomy collected by various authorities after the death of Emperor Frederick. In all they number four hundred and sixty-six, fifty-nine, or nearly thirteen per cent., of which he claims as successful because in them the patients were still alive, and had not suffered recurrence for at least one year after the date of operation. But it is hardly fair to say that a case is cured simply because the patient has managed to survive one year. The lapse of a few years more would show a marked falling off, as is proved by Kraus's own statistics, for, of twenty patients who lived for over one year, fifteen died before the end of the third year Moreover, recurrence may take place after the lapse of a considerable amount of time. Even the fact that death may have occurred without recurrence is not necessarily a proof of the success of the operation, since the very demise of the patient may have been more or less directly due to his having been subjected to so severe a surgical procedure.

Discouraging as these inaccuracies may appear, it has seemed to the writer that the time was rapidly approaching when the number of cases operated upon by means of the various recognized methods would have increased to such a degree that a clearer idea could be gained of their relative value as compared with each other, and that a sufficient length of time would have elapsed to prove their ultimate results, so that the question as to whether they actually succeed in prolonging life might be definitely settled, and if they do, the approximate extent to which they may be depended upon to so prolong it. While many cases and collections of cases have already been recorded, and statistics have thence been deduced and offered to us, there is nothing which can to-day be relied upon as satisfactory in any department of this subject, either in the case of operations performed by the natural passages or of those of the more radical and heroic kind. This is not alone owing to the small number of cases operated upon. It is certainly due in part to the failure of many operators to record faithfully and fully all of their cases. Of course, it is not to be supposed that such operations are common. Doubtless they are not, and, when performed, they have not seldom proved so unfortunate that to have reported them would have been an unwelcome task. Many operators, it is true, have been most careful to publish everything connected with their work—as, for example, the excellent reports of Billroth, Hahn, Butlin, Lanz, David Newman, Cheever, Solis-Cohen, Fowler, Gerster, and others. But in this, as in other departments of medicine, it too often happens that

the unsuccessful cases are allowed to pass unnoticed. Where this is the case and the successful ones alone are put on record, it is plain that the latter will be misleading and, to the statistician, worse than useless. To secure satisfactory knowledge, all cases, good and bad alike, must be reported.

It is certain that, both in this country and abroad, published records have not been made of a considerable number of important cases, but that many have been allowed to pass unnoticed, and thus the lessons that might have been learned from them lost. If the truth must be confessed, this is probably quite as true of the simpler operations from within as of the capital ones, so that in considering the question we do so entirely without prejudice. The substance of the whole matter is this: namely, that heretofore the discussion of the value of the various methods has been based partly upon theory and partly upon evidence too meager to afford substantial proof. What is needed to-day is the largest possible collection of reliable data, embracing all of the different operations which are performed for each of the separate manifestations of cancer of the throat. The gravity of the situation is such, and the need for help so urgent, that we hardly go too far when we insist that a full, painstaking, and accurate account be given of the history of every malignant growth removed from the upper air passages. With such material at our command, many at least of our present difficulties and doubts might be removed, and while it would not at once be possible to solve them all, it would, without question, enable us to advise with more intelligence and to act with materially increased prospects of success.

Thus it might be definitely determined whether or not a certain operation was under any circumstances justifiable, and if justifiable at all, under what circumstances it would be likely to yield the best results. Again, much more might be learned as to the relative value of different methods—as, for example, the operation for complete laryngectomy as compared with partial, or of laryngectomy in general as compared with intralaryngeal operation, or as to whether the average duration of life was greater where a cancerous tonsil was removed by external incision, division of the jaw, and extensive dissection, than in cases operated upon by external incisions of a simpler nature.

Indeed, as we survey the field many questions arise which are in need of definite settlement and which can only be determined by the study of full and accurate statistics. Thus, a fair comparison

should be made between the results of operations for the removal of tumors of the pharynx and nasal cavities by severe preliminary operations, such as Annandale's, and those in which the galvano-caustic loop has been employed; between laryngectomy and intralaryngeal operation, etc. Again, one method may be found to prolong life to a greater degree than another, and yet not indefinitely extend it. Laryngectomy usually results in death within three years, even although recurrence may not have taken place. May this not be due in many cases to the general effect of the operation? Certainly in extensive operations about the nasal cavities profound shock may result from the necessary interference with the various important nervous structures in the neighborhood. Yet again, in view of the fact that the earlier statistics of laryngectomy are better than those of recent years, may it not be possible that this operation, if practiced at all, should be performed by a few highly skilled and successful surgeons, rather than committed to those whose experience in it has been limited? These are but a small part of all the unanswered questions. Let every case then be reported with careful detail, not only as to the method of operation, but, almost more important still, with clear and full description of the after-care of the wound and of the special difficulties and accidents presented with each individual, for the after-care is often by far the most trying and hazardous part of the whole matter.

And, finally, when we have done our best and have exhausted our resources, in case all of our present methods of curing carcinoma should be proved practical failures, even this unhappy result would be of benefit in destroying delusive hopes, and, what is of far greater practical importance, in stimulating us toward the accomplishment of that not impossible discovery from which it shall be learned that cancer may be cured by other means than the knife.

Discussion.

Dr. J. Solis-Cohen, of Philadelphia: I think we are very much indebted to Dr. Delavan for calling our attention to this subject. There are various reasons which prevent men from giving statistics of their operations. The operations usually take place in busy hospital wards, and after the surgeon has attained a certain eminence and does not longer wish to advertise himself he neglects to present these cases to the profession. He may make a memorandum, but he is busy with his work, puts away his notes and forgets about them. Even many successful cases of operation for carcinoma of the pharynx, tonsils, etc., have thus never been reported. A younger man, on the contrary, will report his cases

because he wishes his friends to know that he is in the field, and is as successful in the long run as his colleagues. Another point is this: A surgeon often operates and the case turns out unsuccessfully on account of neglect of the after-treatment. Some surgeons, for instance, will operate in a severe case in the morning and leave the patient to the usual attendant or to an assistant, and go fishing in the afternoon, and of course such men do not like to acknowledge their neglect. The patient may recover; but again he may not, and I think a great many failures are due to this cause—lack of proper supervision by the operator of the subsequent management of the case. Another cause: After a man gets along in practice he loses much confidence in statistics. A practical man, while he knows the general trend of opinion, finds that he does best by studying his own cases. He may have performed a certain operation fifty or seventy-five times, and he will know or feel that in certain cases the operation will or will not prove successful, no matter what the general statistics may indicate. Therefore, if we depend too much on statistics, we are in danger of not looking sufficiently closely into the merits of each particular case. The success of an operation depends on a variety of things: the condition of the patient, his surroundings, his opportunities for after-treatment, the stage of the disease, etc. The statistics of such men as Billroth, Krause, Lange, and others, who keep accurate records of their cases, are of course very valuable. In this country hospital practice is different, too, from that abroad. There, physicians are often paid for their services, and certain duties are expected in consequence. The personal responsibility is greater. Here we are not paid for our work in the hospitals, and unless a case presents some peculiar features to which we desire to call the attention of the profession, we neglect it, just as we neglect a good many other things as we get older.

Dr. Delavan: I admit that it is very difficult to get accurate statistics, but do not see how we can advance unless through the medium of just such material. It is desirable that each of the members of this association should try to do his part toward stimulating his surgical friends to greater accuracy of detail in this matter. In the statistics of the last ten years, those of the last five years are less favorable than those of the preceding five. This is said to be due to the fact that during the first five years the operations were performed by distinguished surgeons, whereas in the last five years they have been done more generally. This should induce us to ascertain who the best surgeons are for this class of operations. It is not alone the operation itself which requires especial experience and skill. The after-treatment is an all-important matter, as Dr. Solis-Cohen has well said, and upon it will often depend the success of the case. There are so many difficulties in the way of successful after-treatment, and such variety is presented in the special necessities of different individual cases, that the full reporting of every case would, for the present at least, be valuable and instructive. The outlook for many

of these cases is so unfavorable that we can not emphasize too strongly the necessity for recognizing and for giving to the world any information which promises to be helpful, even in the slightest and most remote degree. It is in this spirit that I have brought the subject before you.

Paper.

ARTHRITIS DEFORMANS OF THE LARYNX.

By W. E. CASSELBERRY, M. D.

THE propriety of the introduction of this title into laryngeal nomenclature must depend upon the final disposition by pathologists of the same question relative to arthritis deformans in general, the disease which is also termed rheumatoid arthritis. If it be conceded, as is now claimed by most writers on the subject, that arthritis deformans is quite independent of rheumatism on the one hand and of gout on the other, then its laryngeal complication, which I believe I am about to describe for the first time, will be entitled to independent consideration. If, however, the disease be eventually relegated to the class of rheumatic affections, then it is hoped only that this contribution may prove of interest as descriptive of a rare laryngeal phase of the latter disease.

Concerning the individuality of arthritis deformans, Dr. Leonard Weber, in the *Reference Handbook of the Medical Sciences*, says: "It is distinguished from gout and rheumatism by the peculiar morbid changes it produces in the articular tissues and by the absence of any known abnormal state of the blood." "The name 'rheumatic gout,' which has been given to it, is evidently a misnomer, as it is neither gout nor rheumatism."

From careful studies of the morbid anatomy of arthritis deformans, R. Volkmann, cited by Weber,* recognizes the rapid proliferation of the articular cartilaginous elements, particularly on the free surface of the cartilage, as the essential factor of the disease, together with subsequent absorption of the cartilages. Garrod † failed to discover any pathognomonic changes in the blood, and Weber ‡ states that it is a fact that uric acid has not been found in the blood, and that analysis of the urine has failed to show unusual increase of uric acid or urates. Moreover, deposits of urate of sodium, which are constant in gout, are not found in arthritis

* *Loc. cit.* † Cited by Weber. *Loc. cit.* ‡ *Loc. cit.*

deformans, and the changes which are found are quite different also from those of simple articular rheumatism. Inasmuch as Charcot and others have demonstrated an ætiological relationship to exist between certain spinal diseases and other peculiar morbid states of the joints, a trophoneurotic origin of arthritis deformans has been suggested.

Substantially the same views relative to the independence of this disease are expressed by Senator in von Ziemssen's *Cyclopædia*, and by Howard in Pepper's *System of Medicine.*

In February, 1893, I was requested by Dr. E. J. Doering, of Chicago, to see in consultation Mrs. S., a widow, about fifty-eight years of age, in affluent circumstances, but of plain habits and mode of life. She had been suffering for some weeks from laryngeal dyspnœa, which was now so severe as to occasion marked inspiratory stridor and a noticeable expiratory noise. The laryngeal image, at the first trial, was only fairly satisfactory, but gave one the impression of acute laryngitis of moderate intensity only and without adequate explanation of the dyspnœa, for there was no œdema and the ventricular bands were so little swollen that on phonation of the vowel "e" the vocal cords could be seen approximated in the median line. On cessation of this sound the epiglottis would fall so quickly that the cords could not be viewed during the stage of abduction. The arytænoid eminences appeared swollen and their movements restricted, but they were not grossly distorted. After a few days' training a much better view of the larynx was obtainable, and I then observed that abduction of the vocal cords could not take place, their separation at best, whether during ordinary quietude or on forced inspiration, being so slight that but the smallest possible space between them was provided for respiration. Another conspicuous feature of the view was a peculiar thickening or swelling of the posterior ends of the vocal bands, sufficiently marked to cause each posterior end to bulge perceptibly downward as well as upward, and to project into the rima glottidis beyond the line of the purely fibrous part of the cord, encroaching upon its fellow of the opposite side. The part of the vocal cord thus affected is commonly designated the cartilaginous portion, because of the projection into it, as it were, of the vocal process of the arytænoid cartilage, which gives attachment to the fibers of the cord proper, or the presence in its substance of this vocal process in the form of a sesamoid cartilage, detached from the body of the arytænoid, as described by Solis-Cohen, and because, further, of the cartilaginous film imbedded therein in female subjects, as described by Seiler. The position of the vocal process formed a distinct "line of demarcation" between this curiously thickened posterior end of the vocal cord and its main portion or purely fibrous part, the latter being congested and relaxed, but not enlarged or thickened. The appearance was suggestive of inflammatory infiltration

in the deep substance of this part of the cord, and, in connection with other features of the case, it is a reasonable inference that the curious enlargement at this point was due to proliferative changes in the cartilaginous elements, especially as the arytænoid cartilage itself was likewise involved. I have mentioned that the arytænoid eminences appeared more than usually prominent, but not unequally so, and that their motion was restricted in correspondence with the want of the power of abduction of the vocal bands. It seemed reasonably certain that this inability of the vocal cords to separate was due to ankylosis of the crico-arytænoid articulations. A similar aspect could be produced only by paralysis of the posterior crico-arytænoid muscles in conjunction with acute laryngitis, but "posticus paralysis" would not be accompanied by the peculiar condition of the posterior ends of the vocal cords above described, or by enlargement of the arytænoid eminences. The stridor of "posticus paralysis," furthermore, is inspiratory only, the cords on expiration presenting upward like a dome with an elliptical space between them. Moreover, neither the history nor the subsequent course of the case would justify a diagnosis of abductor paralysis. Daily opportunities were afforded for laryngoscopic observation, and during the following two weeks the condition remained practically unchanged. The dyspnœa gradually exhausted her strength and a time was appointed for the operation of tracheotomy, but just then respiration became somewhat easier and it continued to improve until, at the end of six weeks, she breathed noiselessly and, during quietude, without conscious effort. The aspect of the larynx, however, had changed but slightly. The congestion was less marked, the vocal cords appeared paler and thinner, and the space between them on inspiratory efforts at abduction was somewhat wider, with a corresponding slight increase of motion of the arytænoids, but the cords could not be estimated to separate, even now, more than one sixth part of the natural distance, and the arytænoid eminences and the posterior ends of the vocal cords presented the same appearances. Her larynx was again free of viscid mucus, which had intensified the dyspnœa, and the cough had subsided so that the patient expressed herself as feeling about as well as usual. True labored respiration was at once excited by any considerable exertion, but to more or less of this she had been accustomed for years.

Evidently this attack had not been one alone of ordinary laryngitis, but rather of an acute exacerbation of a chronic laryngeal arthritis, an inference which is further justified both by the history and the presence of a general arthritis deformans. The patient previously had twice suffered, at intervals of two or three years, from similar attacks, the second seizure having been equally severe, but of shorter duration. She chanced at that time to be traveling in Germany, and was under the treatment of a competent laryngologist, who subsequently told her that the opening of the larynx was unusually small, and that the laryngeal disease was connected with her so-called rheumatic gout. This general

arthritis has affected the patient progressively for from ten to fifteen years or more, having commenced so insidiously as to have attracted but little serious attention during its earlier years. It closely corresponds to the typical form of polyarticular arthritis deformans, as described by Weber* and others.

The joints of the right and left sides are affected symmetrically throughout, a feature which is manifested likewise in the two crico-arytænoid articulations of the larynx. The hands are characteristically distorted, and distorted wonderfully alike, displaying prominently the enlarged and nodular condition of the ends of the phalanges and the heads of the metacarpal bones. The fingers are no longer articulated in a straight line with the metacarpal bones, but are all partially dislocated outward in the direction of the little finger. The joints are stiff, but not immovable, and she has succeeded in counteracting the usual tendency to flexion of the fingers by regularly maintaining them extended against the bedding at night. The thumbs are dislocated backward. Her wrists exhibit similar nodosities and are stiffened. The elbows and shoulders are less affected, the disease having manifested itself first and most severely in the extremities, and especially in the hands. Her feet and ankles are similarly affected, but not conspicuously so. The left knee is involved to such an extent that in sitting she must maintain it in a position of extension. The hip joints as yet seem but little affected.

The patient has never had a typical paroxysm of gout or suffered from acute articular rheumatism; in fact, she states that her disease has not at any time been accompanied by pain, but merely at certain periods by a sense of discomfort which approaches pain only on forced movement of the affected joints. Nor has she experienced any pain in the region of the larynx, a point which seems further to distinguish this laryngeal complication from rheumatism, which, when affecting the larynx or pharynx, has quite invariably been described as accompanied by pain, often severe and lancinating in character. All treatment in the past and during the recent seizure formulated on the supposition that her disease might be either gout or rheumatism has uniformly and utterly failed.

Treatment directed especially to the chronic arthritis deformans of the larynx has been attempted only at times of acute exacerbation of the disease, and during the last attack it was directed chiefly toward relief of the dyspnœa. She could inhale fine sprays into the larynx fairly well if the tongue were held out and the head thrown backward. A preliminary spray of a two-per cent. solution of cocaine would afford prompt, albeit temporary, mitigation of the dyspnœa, doubtless by contracting the congested vessels of the mucosa, and would also, by benumbing the parts slightly, permit of a more thorough application of subsequent sprays. An alkaline and antiseptic spray, containing sodium bicarbonate, sodium borate, menthol, oil of eucalyptus, oil of gaultheria, glycerin, and water,

* *Loc. cit.*

served to augment and prolong the good effects of the cocaine and to cleanse the larynx of viscid mucus. Later, sulphocarbolate of zinc, ten grains to the ounce of water, was employed with benefit. As a final inhalant I would use the following soothing petroleum combination, which in this case, as in many others of acute inflammation of the larynx, trachea, and bronchi, I have used with much comfort and benefit to the patient:

℞ Ol. pini canadensis..... ℥v;
Ol. gaultheriæ..... ℥ij;
Ol. eucalypti..... ℥ij;
Menthol..... gr. j;
"Benzoinol"..... ʒij;
"Vaselin oil"..... q. s. ad ℥j.

M. Sig.: To be used with a double-bulb atomizer.

The persistent use of these remedies simply served to keep the larynx free of mucus and the congestion at a minimum, but without them I am convinced that the operation of tracheotomy could not have been avoided.

After their use, especially at night, when the dyspnœa seemed most urgent, the exhausted patient would obtain sufficient relief to permit of much-needed rest and slumber.

Discussion.

Dr. W. K. Simpson, of New York: I think the diagnosis of arthritis deformans of the larynx, unless rheumatic manifestations exist in other parts of the body, is very difficult to make. This was impressed on my mind by a case which was under my care for a number of years. The patient was a woman with arthritis deformans confined to the larynx. She was subject to acute exacerbations of the disease. The larynx was very much inflamed, and sufficient obstruction was produced to necessitate intubation. She did well under this treatment, and had no further trouble for a number of months. Her second attack was more purely of the arthritis deformans type. There was no acute inflammation of the larynx; on the contrary, it was very pale; the cords were adducted, and there was a swelling of the crico-arytænoid joints, necessitating intubation a second time. In consequence she has a permanent ankylosis of the right arytænoid articulation, and very little movement on the other side. The woman was thirty-five years of age, and gave a history of syphilis and rheumatism.

The question comes up why the breathing was so much interfered with in the case narrated by Dr. Casselberry. I think in these cases there is a certain amount of submucous thickening below the cords.

In another case that was under my care I think the trouble was congenital. The patient was a young man, aged twenty years; he comes from a phthisical family. There was marked hypertrophy of the tonsils,

and very decided deformity at the right crico arytænoid articulation. When phonation is attempted, the arytænoids override somewhat. In this case the rheumatic tendency may be thrown out. The young man came to me and inquired whether he could use his larynx in singing. I told him it was impossible to decide until he tried it. He did so, and found it impossible to continue for any length of time without suffering from hoarseness due to exacerbations of his condition.

Dr. CASSELBERRY: I regret somewhat that the discussion or criticism of my paper has not been more general, because I recognize the fact that its title and substance are unique. The relief which was afforded is readily explained by the fact that at the height of the seizure it was an acute exacerbation of a previously existing chronic arthritis. It is well known how small an aperture a patient can breathe through comfortably after he gets accustomed to it. One observes this in cases of stenosis of the larynx. We also know how quickly an attack of acute laryngitis, superimposed on this chronic condition, will cause violent dyspnœa. Such seems to have occurred in this case. In arthritis deformans or rheumatic states the patients are subject to acute exacerbations. It was so in other joints throughout the body of this patient; it was so in the larynx. The symptoms would remain quiescent for a time, and then the patient would be seized with an acute exacerbation.

Concerning the title of my paper, I endeavored to make it explicit that the name "arthritis deformans" was adopted, instead of rheumatoid arthritis or rheumatic gout, which names are the ones commonly employed, because of the position which has been taken by pathologists in general that this disease is entirely distinct from either rheumatism or gout; that it is not rheumatism, that it is not gout, and therefore entitled to an independent name. The laryngeal complication of arthritis deformans consequently is not correctly described as rheumatic or gouty, but should accord with the nomenclature of the general disease, and is best described under the name of "arthritis deformans of the larynx," as expressive of its independence of rheumatism or gout.

Paper.

RECURRENCE AT A NEW SITE OF A LARYNGEAL GROWTH (PAPILLOMA) IN A CASE ALREADY REPORTED UNDER THE TITLE, "EVULSION OF A LARYNGEAL TUMOR WHICH RETURNED TWENTY-TWO YEARS AFTER ITS REMOVAL BY LARYNGOTOMY." WITH AN ANALYSIS OF THIRTY-FOUR CASES.

By R. P. LINCOLN, M.D.

I AM encouraged to invite your attention for a few minutes to the following report by my conviction that subsequent histories of operations are often essential to enable the surgeon to determine

the best mode of treatment. Unfortunately, it too often happens that an ultimate history is not available when sought for, because not recorded. Were such data accessible our prognosis would be more definite, and consequently the patient and physician more in accord.

I beg, therefore, to offer a brief digest of the report of a case presented by myself to this association four years ago, a full report of which may be found in the *Transactions* of the eleventh annual meeting of this association. Illustrations of the original tumor, reproduced from a lithograph, and of the first recurrence, made from photographs, are embodied in the report. Following this I will furnish an account of a third growth springing from a point hitherto free from disease, and then attempt an analysis of thirty-four recorded cases.

Our subject is a lady who, in 1862, when twenty-three years of age, first experienced difficulty in her larynx. Two years later the late Dr. Elsberg demonstrated a tumor of large size extending below the vocal cords. "It was attached in front along a line across the whole epiglottis and the posterior parts of the vocal cords." The growth, in bulk amounting to a "small egg," was removed by forceps and the base cauterized with acid nitrate of mercury. The result of treatment was not permanent. The tumor reproduced itself and necessitated further operation. In 1867 Dr. Elsberg performed laryngotomy and completely eradicated the growth.

The patient remained free from any symptom of trouble for twenty-two years. In January, 1889, I first saw her, when I found "a tumor of about the size of a large kernel of corn growing from the posterior third of the right vocal cord. The tumor was of a light pink color and resembled an ordinary papilloma." Our fellow, Dr. French, made a photograph of the larynx and its contents. On May 24, 1889, the whole of the tumor was removed by Cuzco's forceps. A few days later the seat of the growth was thoroughly cauterized with the galvano-cautery. The pathologist, Dr. Ferguson, examined a specimen of the tumor and pronounced it a simple papilloma, and not likely to return. After the recovery from the effects of the operation in 1889 the patient enjoyed a good speaking voice and freedom from hoarseness, in fact no inconvenience from the vocal organ, until the past winter, when a steadily increasing hoarseness led her to again consult me. An examination revealed a new development of growth, not where I expected to find it, but springing from the left vocal cord anteriorly, near the commissure. It was a little more than half as large as that removed four years ago. Though smaller than its predecessor, it caused greater inconvenience, probably from its position the patient often experiencing suffocative attacks, due apparently to spasm of the glottis. Coughing, too, was very harassing. Intolerance expresses the condition. On April 20th the

tumor was removed with the same facility and by the same method as already described in the previous treatment. The relief of all symptoms was more immediate. The microscopic character of the growth was identical with that of the former.

In connection with this case I have thought it would be interesting to tabulate all the cases of laryngeal papilloma recurring after operation that I could find in medical literature, and after a very hurried search I have succeeded in collecting thirty-four, including the one just narrated.

Among the questions naturally arising from a study of these cases are the following: Does this table harmonize with the present views of pathologists in regard to the recurrence of benign tumors? Does the result of the operations indicate that the methods employed are defective in completely eradicating the neoplasm, or is the inference that there is in some individuals an inherent tendency to the development of morbid growths, such as papillomata?

In Heath's excellent *Dictionary of Practical Surgery*,* which is designed to present a compendium of the latest accepted opinions on the subjects of which it treats, Mr. Alfred Willett makes the following comprehensive statement in regard to the subject of recurrence: "Non-malignant tumors are seldom reproduced, and one is tempted to say never, if the whole of the visible growth has been removed." That this is altogether too sweeping an assertion as regards laryngeal papillomata, many of the cases in the table would seem to clearly indicate. In a considerable proportion of instances there can be no question that some portion of the neoplasm remained after operation. This is expressly stated to be the fact in Cases 2 (Fauvel), 4 (Fauvel), 11 (Fauvel), 12 (Mackenzie), 18 (Fauvel), and 23 (Lennox Browne). In others, notably mine (2) and one of Mackenzie's (14), the fresh growths were entirely on new sites, and can not therefore be strictly called recurrences. Excluding these two classes of cases, there remain a certain number of cases in which, although complete eradication was effected, a recurrence proper of the tumor took place on the original site. In some instances—as in Cases 24 (Lennox Browne), 26 (J. H. White), and 27 (Eliasberg)—the fresh growths occurred both in the former situations and in new ones.

"It is an altogether different thing," says Felix Semon,† "whether from the same place from which a papilloma has just been removed

* Vol. ii, p. 681.

† Heath's *Dictionary of Practical Surgery*, vol. i, p. 894.

a fresh one springs up, or whether after the removal of a papilloma from the anterior commissure of the vocal cords another one begins to grow from one of the laryngeal ventricles. The latter event is evidently no 'recurrence' in the proper sense of the word, though often, wrongly thus denominated, but evidence of a tendency to general papillomatous degeneration."

As to the likelihood of recurrence of papilloma after extirpation, remarks Sajous,* the following rules, according to Paul Bruns and Oertel (quoted from Morell Mackenzie), who divided papilloma into three classes, may furnish an approximate idea.

First Class.—Light-red or dark tumors, varying in size from a millet seed to a bean, with uneven surface and broad base, sometimes solitary, but generally thinly scattered and never numerous, either do not recur at all or only after some months.

Second Class.—Whitish-gray, exquisitely papillary, warty, or conical tumors, nearly always originating with a broad base from the vocal bands in adult patients, also recur very slowly, often not till after several years.

Third Class.—Large reddish tumors resembling a mulberry or cauliflower. They may be solitary, but are most frequently multiple, and are commonly seen in children. These generally recur after one or two months.

A strong confirmation of the correctness of these views in regard to the third class of papilloma mentioned is afforded by Cases 21 (Hooper), 26 (J. H. White), and 27 (Eliasberg).

As a rule, of course, in benign tumors, the more complete the extirpation, the greater will be the chance of immunity from recurrence. But whatever procedure may be adopted, and however perfectly the growth may be removed, there will be cases met with from time to time in which recurrence inevitably takes place. Why this should be so can probably be explained only on the hypothesis that in certain individuals there is an inherent tendency to the development of neoplasms on the mucous membranes. In regard to the ætiology of papilloma of the larynx Garel † gives his hearty assent to the opinion of Thost, that papilloma is not properly a tumor, but merely a proliferation of the mucous membrane, and that this proliferation will be produced, for example, under the direct irritation of the membrane due to purulent, viscid, or dry secretions such as one meets with in the various catarrhal affections.

* *Diseases of the Nose and Throat*, Philadelphia, 1885, p. 380.

† *Annales des maladies de l'oreille*, etc., June, 1891.

The principal ætiological factor in the development of papilloma and other non-malignant growths in the larynx is assigned by various authorities (Fauvel,* Mackenzie,† Cohen,‡ Lennox Browne,# Semon,‖ Sajous△) to be chronic hyperæmia of the mucous membrane. Says Lennox Browne,◊ for instance: "Without doubt the most common cause is hyperæmia, and naturally all which tends to excite congestion will predispose to the production of new formations. Catarrh, the use of the voice during catarrhal attacks, certain occupations accompanied by the inspiration of noxious vapors, may all be considered predisponents of laryngeal growths." Bosworth, so far as I am aware, is the only writer who maintains that a large majority of the cases develop in a perfectly healthy larynx, stating that, at all events, in most of those which have come under his own observation it was difficult to discover any existing inflammatory condition. Traumatism, however, in the form of laryngeal strain or overexertion of the voice, he acknowledges, is undoubtedly to be regarded as a not infrequent cause of the disease. That such laryngeal strain is ordinarily accompanied by more or less congestion of the mucous membrane would seem to be the experience of most observers.

But, granting that chronic hyperæmia, laryngeal strain, and various other sources of irritation are instrumental in the production of these neoplasms, this class of causes is evidently not sufficient to account entirely for their development, since there are vast numbers of individuals who suffer from these and yet do not become affected with laryngeal tumors. We are forced, therefore, to the conclusion that in certain persons there is an inherent tendency to the production of such growths. Now if, after the removal of the neoplasm by operation, this tendency still exists, it would seem to be reasonable to suppose that, should favorable circumstances be present for its reproduction, the growth is liable to recur. In discussing the subject of recurrence after removal, Lennox Browne‡ expresses the opinion that such reproduction is much more frequent than is generally supposed, and that while this is sometimes due to the incom-

* *Maladies du larynx*, Paris, 1876, p. 199.

† *Growths in the Larynx*, London, 1871, p. 8.

‡ Ashhurst's *International Cyclopædia of Surgery*, New York, vol. v, p. 724.

The Throat and Nose and their Diseases, 3d edition, Philadelphia, 1890, p. 446.

‖ *Op. cit.*, p. 892. △ *Op. cit.*, p. 379. ◊ *Loc. cit.*

‡ *Op. cit.*, p. 454.

pleteness of the operation, in others it results from a mucous membrane having a neoplastic proclivity.

Furthermore, in regard to laryngeal papilloma, there is some ground for the view held by Fauvel,* that certain persons appear to be the subjects of a special papillomatous diathesis. He states that it is not rare to find on the persons of those suffering from papilloma of the larynx similar warty growths on the skin or on other mucous membranes besides the laryngeal. In two of the cases cited in his work (Nos. 248 and 253), where a brother and sister were affected with papilloma of the vocal cords, he found that both the patients had warts upon the face and hands. In one or two of the cases in my table it is stated by those reporting them that the patient had warts on the hand, and, as we have seen, Semon † speaks of a "tendency to general papillomatous degeneration."

In regard to the matter of operation, experience would seem to show that the various approved methods of intralaryngeal procedure, if employed with skill, will ordinarily accomplish all that can be expected in this class of cases in the way of protecting the patient against a recurrence of the disease. It was formerly maintained that thyrotomy offered a more efficient means of eradicating the growth and securing future protection; but the statistics of Bruns,‡ of Tübingen, are considered by most of the best authorities to have proved these views to be unfounded. Thyrotomy should then be resorted to only under special circumstances, since, as has been said, it has been shown beyond question that in a certain proportion of cases recurrence will take place however perfectly the growth may have been extirpated.

Semon # has found that if, in cases of multiple recurring papillomata, the intralaryngeal removal be perseveringly proceeded with, almost always, finally, a time arrives when the tendency to a fresh formation of these growths appears to become exhausted. His experience has been confirmed by others. In Case 8 (Fauvel), in the table, although a small portion of the growth still remained after evulsion and cauterization, the second recurrence did not take place until five years had elapsed, which, Fauvel believes, goes to show that, even in cases where the destruction is not complete, recurrence, if it ensues at all, may be long delayed. In Case 21 (Hooper) re-

* *Op. cit.*, p. 200. † *Loc. cit.*

‡ Bruns, *Die Laryngotomie zur Entfernung intralaryngealen Neubildungen*, S. 148, Breslau, 1878.

Op. cit, p. 894.

peated operations were performed for nearly a year (the growth in the meanwhile constantly recurring and at times spreading rapidly), when finally the process became arrested; and this notwithstanding the fact that portions of the neoplasm still remained in the larynx. In Case 23 (Lennox Browne) a small fragment of the growth was left, but the recurrence did not take place for two years and a half. In one instance of obstinate recurrence Lennox Browne states * that a good result was obtained from enjoining absolute silence for two months and the application during that period of continuous cold on the larynx by means of a Leiter coil.

It is interesting to note that in two of the cases in the table—26 (J. H. White) and 27 (Eliasberg)—spontaneous cure occurred after the performance of tracheotomy. Dr. White in his report † refers to four other similar cases—two by Oertel, quoted by Hoffmann (Volkmann's *Sammlung klin. Vorträge*, No. 315), one by G. Hunter Mackenzie (*Lancet*, April 6, 1889), and one by Garel (*Annales des maladies de l'oreille*, etc., June, 1891). He also calls attention to the opinion expressed by Thost (Ueber Papillen in der oberen Luftwegen, *Deut. med. Woch.*, May, 1890) that papilloma of the larynx in children will always disappear spontaneously if let alone; that it is a benign neoplasm and without danger. "If this is correct," he asks, "why should thyrotomy, with its attendant risks to life and voice, be performed? Is it not better to let such cases alone, merely keeping them under observation to guard against suffocation from any sudden or unusual excessive development?" It is only in these exceptional cases, he continues, that tracheotomy is called for, and it will be all the surgical interference required.

Finally, in our consideration of this table, it may be well to note the suggestive case (No. 31) in connection with which Lennox Browne directs the attention of the profession—for the first time, I believe—to the possibility of hypertrophy of the pharyngeal tonsil being an ætiological factor of laryngeal papillomata in children. Whether this be really the case or not, the fact remains that the patient, in whom rapid recurrence had taken place, recovered after the removal of adenoid vegetations which were found behind the soft palate. In any similar case it would certainly be advisable, as a possible precaution against recurrence, to adopt the same course.

* *Op. cit.*, p. 44.

† *Journal of the American Medical Association*, October 22, 1892, p. 478.

No. of case.	Date.	Sex.	Age.	Occupation.	Situation and extent.	Treatment.	Operator.	Reference.	Time of recurrence.	Subsequent treatment; final result; remarks.
1	June, 1862.	F.	23	.....	Attached in front along a line across the whole epiglottis, and passing below the vocal cords; of the size of a small hen's egg, and everywhere adherent to the parts beneath except in most dependent portions.	Removal with scissors, cutting forceps, and polypus forceps. Remnant cauterized with acid nitrate of mercury. Later, laryngotomy, without tracheotomy; complete removal of every vestige of the growth.	Louis Elsberg.	*Transactions of American Laryngological Association*, 1889, p. 141.	22 years.	Evulsion with Cuzco's forceps, followed by application of galvano cautery, by Dr. R. P. Lincoln.
2	Sept., 1862.	M.	45	Manufacturer.	Both vocal cords, covering nearly their entire length.	Evulsion with Fauvel's forceps, and cauterization with chromic acid and nitrate of silver.	Ch. Fauvel.	*Maladies du larynx*, 1876, p. 277.	Within 1 year.	Patient returned to his home in the country before the growth was entirely removed. At different times new portions were taken away, and then the case was lost sight of. In 1867 the neoplasm was operated on by Bruns, of Tübingen, with the écraseur, and cauterizations with chromic acid; complete recovery.
3	April, 1863.	M.	44	Carpenter.	Almost the entire lining membrane of the larynx.	Evulsion with tube forceps and application of escharotics.	Morell Mackenzie.	*The Use of the Laryngoscope*, 2d ed., p. 121; *Growths in the Larynx*, p. 215.	On both ventricular bands, March, 1870 (7 years).	Second series of operations with tube forceps; cure.
4	Jan., 1865.	M.	28	Clerk.	Free border of right vocal cord; of the size of a large pea.	Evulsion with Fauvel's forceps.	Ch. Fauvel.	*Maladies du larynx*, p. 346.	1 year.	Patient left before complete destruction of the growth was effected. Evulsion again practiced, with complete restoration of voice. Seven years and a half later patient returned with partial reproduction of the tumor.
5	Dec., 1865.	M.	39	Innkeeper.	Anterior commissure and both vocal cords.	Evulsion with crushing forceps.	Türck.	*Klinik der Kehlkopfkrankheiten*, p. 578.	Within 1 year.	Excision and cauterization; cure.
6	Feb., 1866.	M.	30	Employee in theater.	Right vocal cord; of the size of a pea.	Evulsion with wire loop and application of chromic acid.	Ch. Fauvel.	*Maladies du larynx*, p. 366.	8 years.	Tumor again removed, and did not afterward return.

7	1867.	M.	45	Workman.	Multiple growths on free borders of both vocal cords and inferior surface of epiglottis, and in the angle of the thyroid cartilage.	Evulsion with Fauvel's forceps.	Ch. Fauvel.	*Ibid.*, p. 418.	Within 6 months.	Neoplasms much larger and more numerous than before. Evulsion and cauterization with chromic acid. Rapid reproduction, rendering respiration difficult. Tracheotomy and evulsion. Again rapid recurrence. Thyrotomy, evulsion, and cauterization with chromic acid. The growths still continued to recur. Death from intercurrent pneumonia. The later portions removed were composed of young embryonic tissue strongly resembling sarcoma.
8	Feb. 14, 1867.	M.	38	Grocer.	Both vocal cords and posterior surface of epiglottis.	Evulsion with Fauvel's forceps and cauterization with perchloride of iron.	Ch. Fauvel.	*Ibid.*, p. 435.	3 years.	Cauterization with nitrate of silver and acid nitrate of mercury. Evulsion with forceps. A small portion of the growth still remained. Five years after this there was another marked recurrence, and evulsion was again practiced. Patient still under treatment.
9	July 3, 1867.	F.	31	.....	Whole lining membrane of larynx.	Evulsion with tube forceps.	Morell Mackenzie.	*Growths in the Larynx*, p. 215	June, 1870 (3 years).	Second series of operations with tube forceps, and recovery of voice.
10	Sept., 1867.	M.	16	.....	Both vocal cords.	Evulsion with wire loop and application of chromic acid.	Tobold.	*Berlin klin. Wochenschrift*. 1869, No. 3.	Within a short time, cure.	Two or three recurrences; ultimate cure.
11	Feb. 4, 1868.	M.	42	Engineer.	Free borders of both vocal cords; of the size of a small bean.	Evulsion with Fauvel's forceps; pedicle still remained.	Ch. Fauvel.	*Maladies du larynx*, p. 427.	Within 2 months.	Evulsion and cauterization with perchloride of iron; permanent cure.
12	Feb. 8, 1868.	F.	31	.....	Right vocal cord.	Evulsion with tube and common laryngeal forceps.	Morell Mackenzie.	*Growths in the Larynx*, p. 217; *Med. Times and Gazette*, June 13, 1868.	Within a short time.	Fresh growth in consequence of not all having been removed on the first occasion; complete recovery ultimately.
13	May 4, 1868.	F.	66	.....	Left ventricular band.	Evulsion of a portion with common laryngeal forceps; subsequently tracheotomy and thyrotomy.	Morell Mackenzie.	*Growths in the Larynx*, p. 219.	2½ years.	Cure.
14	July 2, 1868.	M.	8	Wine merchant's son.	Right vocal cord.	Evulsion with tube-forceps and destruction with caustic solutions.	Morell Mackenzie.	*Ibid.*, p. 219.	Fresh growth 2 years later on posterior wall and on left ventricular band.	Repetition of treatment and recovery of good voice.

No. of case.	Date.	Sex.	Age.	Occupation.	Situation and extent.	Treatment.	Operator.	Reference.	Time of recurrence.	Subsequent treatment; final result; remarks.
15	Sept. 3, 1868.	M.	61	Upholsterer.	Free borders of both vocal cords and in the angle of the thyreoid cartilage.	Evulsion with Fauvel's forceps.	Ch. Fauvel.	*Maladies du larynx*, p. 465.	Within 1 year.	Evulsion with forceps, repeated at intervals during two months; patient then lost sight of.
16	Nov., 1868.	M.	15	Page.	Left vocal cord.	Evulsion with tube forceps.	Morell Mackenzie.	*Growths in the Larynx*, p. 219.	10 months.	Second series of operations; cure.
17	June 3, 1870.	F.	26	.....	Large growth upon left side of larynx, and small growth on right vocal cord.	Evulsion with Cuzco's forceps; remains of growth cauterized with carbolic acid.	J. Solis-Cohen.	*Diseases of the Throat and Nasal Passages*, 2d ed., p. 558.	7 years.	Evulsion and cauterization with nitrate of silver; cure.
18	Aug. 12, 1872.	M.	41	Cashier.	On both vocal cords.	Evulsion with long forceps; growth on left cord not completely removed.	Ch. Fauvel.	*Maladies du larynx*, p. 549.	Within 4 months.	Evulsion. Nitrate-of-silver solution applied to pedicle; cure.
19	1876.	M.	28	Teamster.	.....	.....	George M. Lefferts.	*Med. Record*, 1876; *Journal of Laryngology*, July, 1892, p. 285.	10 years.	For several years after the recurrence the patient had more or less difficulty, and underwent various treatments. In January, 1892, he came under the care of Dr. J. Solis-Cohen. The growth had then penetrated the larynx exteriorly, in a mass larger than an almond. On account of urgent dyspnœa, tracheotomy was performed. Finding it impossible to remove the tumor by intralaryngeal procedures, Dr. Solis-Cohen excised the external growth, and then split the larynx and removed every portion of the internal growth. Recurrence took place at the end of four weeks, and the tumor grew very rapidly, protruding again through the thyroid cartilages. On April 1st excision of the larynx was performed, and the patient made an uninterrupted recovery. The growth was pronounced to be a cylindrical epithelioma. Dr. Solis-Cohen expresses the opinion that there was no conversion of a papilloma into a malignant growth, the latter simply becoming developed on the *site* of the benign growth.

20	Oct. 25, 1880.	F.	28	.....	Anterior angle of vocal cords.	Evulsion with Mackenzie's forceps.	F. H. Hooper.	*Archives of Laryngology*, vol. iii, p. 335.	Within 1 year.	Growth removed a second time in same way, October 10, 1881.
21	Dec. 2, 1880.	M.	28	.....	Nearly the whole of the right vocal cord, and extending into the right ventricle; small excrescences also on left vocal cord, almost the middle.	Evulsion with Schrötter's tube forceps.	F. H. Hooper.	*Ibid.*, p. 336.	Began to recur at once, spreading and involving the ventricular bands and ary-epiglottic folds.	Repeated operations up to November 1, 1881, when the growth appeared to be arrested. Portions of it still remain, but they give rise to no symptoms.
22	1882.	M.	60	Farmer.	On left ventricular band, covering entire left side of larynx and partially the lower part of right side.	Evulsion.	B. Tauber.	*Ibid.*, p. 362.	Within 1 year.	Eighteen months after first operation a large growth was found entirely covering the larynx. Tracheotomy; seven eighths of the tumor removed. It subsequently recurred in a malignant form, and in six months terminated fatally. Diagnosis of cancer confirmed by the microscope.
23	Nov. 20, 1883.	M.	35	.....	One large neoplasm at anterior insertion of vocal cords, and another beneath the left cord at its posterior portion.	Snare and Volto.ini's sponge.	Lennox Browne.	*The Throat and Nose and their Diseases*, 3d ed., p. 460.	2½ years.	A small fragment had been left of the former growth, as the patient had to go away. The entire growth removed at one sitting under the snare, and the voice again restored.
24	July 11, 1885.	M.	11	.....	Large growth hanging down the glottis from its anterior portion, attached to both vocal cords; another small sessile neoplasm growing from edge of left cord, about its center.	Snare and Voltolini's sponge.	Lennox Browne.	*Ibid.*, p. 461.	Within 3 months.	The same treatment repeated. Recovery at the end of three months; another recurrence six months later. The treatment was renewed, and at the time of writing (five months after it was resumed) the larynx was clear with the exception of very slight thickening of the right vocal cord. Mr. Browne states that the frequent recurrence and the difficulty of intralaryngeal treatment were so discouraging that he was several times tempted to perform thyrotomy.
25	1881.	F.	..	.....	Bottom of laryngeal vestibule; of the size of a walnut.	Evulsion; cautery; Voltolini sponge method.	Ariza.	*Revista de Med. y Cirug. Prácticas*, Aug. 7, 1877.	Within a short time.	Neoplasm reproduced in the form of granulations, which grew on all sides. Applications of chloride-of-zinc solutions. Cure after four months of treatment.

No. of case.	Date.	Sex.	Age.	Occupation.	Situation and extent.	Treatment.	Operator.	Reference.	Time of recurrence.	Subsequent treatment; final result; remarks.
26	June 11, 1886.	M.	5	.....	Left vocal cord and ventricular band at inter-arytænoid space.	Evulsion with forceps and cauterization with chromic acid.	Joseph H. White.	*Journal of Amer. Med. Association*, Oct. 22, 1892, p. 478.	4 months.	When the growth recurred it extended to the right side and to the epiglottis. Removal in same way. A second recurrence within one month. Again removed. Within two months the larynx refilled with a cauliflower excrescence. Removal *per vias naturales* was followed by relief, but as the growth was not entirely destroyed, an attack of suffocation twelve days afterward (which nearly proved fatal) necessitated tracheotomy. Any subsequent attempt to remove the growth resulted in increasing the neoplasm. When all operative interference ceased it began to disappear spontaneously, and the case is now perfectly well. The tube has been worn for five years.
27	Dec., 1887.	M.	10	.....	About two thirds of free edge and lower surface of left vocal cord and the anterior commissure occupied by a large number of small neoplasms, in a cauliflower fashion.	Thyrotomy; the growths removed partly with scissors, partly with a sharp spoon, after which Paquelin's cautery was applied to the raw surfaces.	S. S. Eliasberg.	*Meditzinskoie Obozrenie*, 1891, No. 1, p. 46; *Journal of Laryngology*, June, 1891, p. 245.	Within 2 months.	Thyrotomy again performed by Professor Kosinski, of Warsaw. The neoplasms and the left vocal cord removed. In two months an alarming attack of suffocation, necessitating tracheotomy. In about a month the whole organ became literally blocked up with the tumors; but two months later they began to dwindle away, and in three months more the larynx was perfectly clear. No further relapse.
28	June 17, 1888.	M.	2½	.....	Base of epiglottis	Intubation; cauterization with chromic acid, applied to anterior portion of tube and left in position for a few days; another application then made in the same way.	F. E. Waxham.	*Journal of Amer. Med. Association*, Oct. 22, 1892, p. 477.	4½ months.	During the absence of Dr. Waxham in Europe, tracheotomy was performed, and when he returned the larynx was firmly sealed by adhesions. Laryngotomy was performed, the adhesions broken up, and the remnants of the papilloma removed. The tracheotomy tube was allowed to remain, and an intubation tube was also used. There was a constant tendency to the return of the growth

									above the latter, which was as frequently removed by means of the curette. At the end of two years the tracheotomy tube was dispensed with. For two years the patient had worn an intubation tube alone, and he now presented every appearance of health.
29	July 18, 1889.	F.	12	.....	Upper surface of right vocal cord, near the anterior commissure. It extended upward into the vestibule, was oblong in shape, and had an attachment about three eighths by one fourth inch.	Mackenzie's cutting forceps; insufflation of salicylic acid diluted with powdered acacia; tracheotomy, followed by thyrotomy. The growth removed piecemeal by scissors and forceps, and the site curetted with a sharp curette.	F. C. Rayner.	*Ibid.*, April 30, 1892.	3 months.	Intubation was resorted to on account of dyspnœa. Phthisis was detected in the lungs, and seven months after the thyrotomy the child died in a suffocative attack before assistance could be obtained. (The intubation tube had been withdrawn.) An autopsy was not permitted, but the author believes that a deposit of tubercle was probably the cause of the laryngeal obstruction at this time, rather than a true recurrence of the papilloma.
30	1890.	M.	12	.....	Larynx filled with papillomata.	Evulsion; later, thyrotomy and destruction of the neoplasms by the sharp spoon and Paquelin's cautery.	B. Fraenkel.	*Deutsche med. Woch.*, 1891, No. 15.	Within 1 year.	Patient still under treatment.
31	Sept. 13, 1890.	F.	6½	.....	Upper surface of left vocal cord and anterior and inner surface of right arytænoid cartilage; of the size of a flattened split pea.	Evulsion with forceps; curette; cauterization with chromic acid.	McDonagh.	*Journal of Laryngology*, January, 1891, p. 21.	Immediately.	Patient was afterward sent to Mr. Lennox Browne, who removed the neoplasms by evulsion. As the voice soon grew husky again, he removed the tonsils, and also a large number of adenoid vegetations which were found behind the soft palate.
32	Nov., 1890.	F.	10½	....	Both vocal cords, the anterior surface of the arytænoids, the ventricular bands, and the inter-arytænoid commissure.	Evulsion with Mackenzie's forceps.	J. M. Rees.	*Ibid.*, July, 1891, p. 291.	Within a short time.	Operation repeated several times, and all kinds of local medication (lactic acid, iron, zinc, etc.), without result Patient still under treatment.
33	1891.	..	5	. .. .	Anterior part of larynx.	Tracheotomy; repeated extirpation of the growths.	Peralt.	*Annales des maladies de l'oreille*, etc., March, 1892, p. 215.	Within a short time.	Frequent recurrences during eighteen months, but continued amelioration.
34	1891.	..	6	..... .	Anterior part of larynx.	Curette.	Peralt.	*Ibid.*	Within a short time.	Frequent recurrences; but treatment finally resulted in a cure.

Discussion.

Dr. J. Solis-Cohen, of Philadelphia: This is a very interesting case. I should like to take this opportunity to place on record the final result of a case which I reported a good many years ago. It was a patient upon whom, in 1867, I performed laryngotomy and removed an epithelioma. The patient died from hemiplegia during the past year, having had no recurrence. While I have seen very few recurrences of papillomatous growths, a few very remarkable instances of it have come under my observation. For instance, I have at present under my care a school teacher who had several small, white sessile papillomas upon one vocal band, and while I have been, so to speak, in the act of removing them, I have absolutely seen other papillomata appear from the opposite ventricle and upon the corresponding vocal band. Some few years ago I published in the *International Clinics* a lecture before my class on the occasion of removing from a patient a cannula which had been worn several years for recurrent papillomata. I had opened the larynx two or three times and the trachea once to remove recurrent growths, but without permanent relief; and the patient had been compelled to wear the cannula for ten or eleven years before I was able to remove it definitively. I believe that, in the majority of cases, recurrence is due to incomplete removal of the original growth. The patients often live far distant from the operator, and leave before he is through with them. Small portions of these growths, too, are easily left behind. I believe that the skillful laryngologist is just as competent to remove these growths by the intralaryngeal route as the skillful surgeon is to remove them by external methods. Small particles of the growth may be left behind with either method. That is why in the older days we were in the habit of using the acid nitrate of mercury upon tissues whence we had removed papillomas. Now we use lactic acid. I think, if we can supervise the patient long enough after operation, we are fairly safe from late recurrences. There is no reason, however, why a new growth should not spring up from another portion of the larynx than that which has been the site of the earlier growths. I have long been of the opinion that the majority of these cases are due to excessive granulations, following erosions and lacerations, which eventually become organized. These erosions of the larynx are apt to recur, and then the same condition of affairs will be repeated—exuberant granulations and the production of papillomata.

I will mention here a case which I hope to show you before the session closes. One of our members removed a papilloma of the larynx eighteen years ago. The patient remained free from recurrence until a few years ago, when a malignant growth appeared at the site of the previous papilloma. The patient had a catarrhal laryngitis, with exfoliation of the epithelium and erosions of the mucous membrane, and it would be interesting to know whether the malignant growth took its origin at the cicatrix—if there was a cicatrix—or upon the site of the former papilloma,

which raises the question whether the cicatricial or scar tissue present was rendered more vulnerable by the catarrhal condition and gave way first.

Dr. F. I. Knight: I have long recognized a form of papilloma which, when we begin to operate on it, we feel will be permanently removed, and then again another variety which is prone to recur. The first kind are the small, isolated growths, the rest of the larynx being perfectly healthy; the other variety consists of the multiple growths, and with these we feel pretty sure that a recurrence will take place. Such recurrences may happen repeatedly until, after a long lapse of time, the growths cease, as in the case reported by Dr. Hooper. It seems strange to me that we do not get recurrences oftener, because, in operating with the forceps or loop or by other methods, the operation necessarily is not a perfectly clean one. In the majority of cases more or less of the growth is left behind. It has often been a matter of congratulation with me that recurrences do not oftener occur. In the isolated cases I have generally succeeded in getting along with one operation, but in the multiple form there has almost always been a recurrence. Dr. Lincoln's case appears to have become altered in character, changing from the isolated to the multiple form. Perhaps the change in the mucous membrane, as time has gone on, induced this tendency to the recurrence of multiple growths.

With regard to operating on papilloma in children, it seems to me that thyrotomy should not be performed. Tracheotomy may be necessary, and the tumor left for a time, or it can be operated on laryngoscopically in a great many cases under ether.

Dr. Delavan: I have often been struck by the fact that in some cases of apparent papilloma the diagnosis is extremely difficult. In one such case which came under my observation some years ago, and was also seen by Dr. Beverley Robinson, the appearance of the growth and the intralaryngeal symptoms all pointed to papilloma. Thyrotomy was performed, and, although the interior of the larynx was fully exposed to view, we still thought the case to be one of papilloma. The growth proved to be an epithelioma. The appearance of these tumors is often deceptive, and their recurrence may indicate more than a simple papillomatous growth. Under the microscope the deeper structures may show a different condition of affairs. The tendency to repeated recurrence should always suggest the possibility of a more serious disease than simple papilloma. I remember one patient, an Irishman, about twenty-four years old, in whom the papillomata seemed to recur more rapidly than they could be removed. As soon as one was taken away several others would appear. Dyspnœa was so urgent that a tracheotomy was indicated; the man, however, would not submit to it and died very shortly after.

In those cases of persistently recurring papillomata where the recurrence takes place at short intervals, we must bear in mind the possibility of more serious disease.

Dr. Mackenzie: I have very little to add to this already voluminous discussion except to say that, in pursuing the question of the causation of this class of growth, we are still groping very much in the dark. The ordinary causes which are given—for example, that by Morell Mackenzie, years ago, viz., hyperæmia—are hardly sufficient to account for their presence, as we see them in cases in which there is absolutely no hyperæmia. I think hyperæmia has nothing to do with their causation in a large proportion of cases. Another thing which militates against the hyperæmic theory is that we see papillomata in the presence of anæmia, which is just the opposite condition to hyperæmia. Especially is this the case in tuberculosis. Their presence here, however, may be diathetic, and not due to local causes.

I would call attention to the great frequency of papillomatous growths in the upper air passages of the negro race. There seems also to be a greater tendency to recurrence among negroes. They often spring up like mushrooms after removal. One of my patients has been wearing a tracheotomy tube on account of them for seven years. I think that in many cases of papilloma we meet with among singers whose vocal culture has been poor there is something wrong in the apparatus of voice production. We know comparatively very little about vocalization and the complex mechanism of the separate fibers of the vocal cords, and I have no doubt that some of these papillomata of the cord originate as a result of faulty vocal mechanism.

I think Dr. Delavan has called our attention to an extremely important point, and it is my opinion that we should never remove a growth from the larynx or anywhere else, no matter how sure we are of its character, without submitting it to the microscope. I think that such a course is demanded by the scientific accuracy in diagnosis prevailing at the present day, and we should submit all cases, especially if they are at all doubtful, to a microscopic test.

Dr. F. I. Knight: I should like an expression of opinion from the members present in regard to the development of epithelioma in cases which were supposed at first to be simple papilloma. It would be a very easy matter for every gentleman present to give us his experience in this matter. I have seen but one case where I thought I had to deal with a simple papilloma in which malignant disease was proved to exist afterward.

Dr. J. Solis-Cohen: The case I referred to in my previous remarks—the patient who died twenty-five years after operation—is one in point. In that case a microscopical examination was made. In other cases that have come under my observation I suppose I may have been deceived, because in my early days we did not submit specimens of all these growths to the microscopist. In the cases mentioned, however, the tumor grew very rapidly. It was examined by Professor Da Costa and by the late Dr. Woodward, of the United States army, who was probably the best microscopist of his day. Both of these gentlemen pronounced it epithe-

lioma. I then determined to open the larynx and remove the growth, which I did, together with the vocal band and the whole of the ventricle, cutting into the sound tissues. As no other cases of epithelioma of the larynx had been reported in which the patient lived for five years after operation, I was for a time inclined to believe that a mistake in diagnosis had been made in my case. Since then, however, we have learned that such patients have survived for longer periods than five years, and I now believe that this case might have been one of epithelioma. I have seen other cases which at first had all the macroscopical appearances of papilloma, but which, after being picked at and pulled at, have proved to be really malignant growths, thereby accounting for the apparent recurrence.

The PRESIDENT: I would suggest that the question raised by Dr. Knight would be more properly discussed in connection with Dr. Simpson's paper, and if it be satisfactory to the fellows we will defer it until that time.

Paper.

INTUBATION IN THE ADULT.

By GEORGE M. LEFFERTS, M. D.

I HAVE chosen this subject for two reasons: First, because it possesses certain elements of novelty, and thus meets a difficulty that stands in the way of a choice of any topic suitable for presentation to an audience of experts. Intubation in the child has been almost exhaustively discussed during the past few years, has long since passed its period of probation, and has assumed a well-defined position as a remedial resource for the relief of dangerous conditions. Intubation in the adult, on the contrary, as a glance at contemporaneous literature will show, is a question that has as yet had but comparatively little attention bestowed upon it. It therefore offers a suitable and, I believe, a fruitful field for our cultivation.

Secondly, this same topic having been selected for a general discussion in the tenth section of the coming Eleventh International Congress, and I, together with Dr. Schmiegelow, chosen to introduce it, it has seemed to me desirable that it should first be brought before this American audience, in the home of modernized and utilized intubation, in order that I might avail myself of your experience and criticism, and thus be able to give an authoritative and even national weight to what I may have occasion to say in Rome.

Any discussion concerning the question of intubation in the

adult presupposes the theory that the ultimate object of the introduction of a proper tube into the diseased larynx is, first, to overcome the most urgent acute symptoms of obstructed laryngeal respiration; secondly, to restore, as far as may be possible, the interior of the stenosed larynx to its normal caliber, and even configuration, by relieving the stenosing conditions; thirdly, to obviate the necessity of resorting to either a laryngotomy or a tracheotomy; and, finally, to facilitate the withdrawal of the tracheal cannula in certain cases where difficulties arise to prevent it.

Regarded from these standpoints, we may either deal alone with the question of the technique of the procedure, illustrating its practice by the detail of cases, or, as I have chosen to do, discuss its theory, in which event such discussion practically resolves itself into an enumeration of a variety of intralaryngeal conditions for the relief of which the use of the large-sized or adult intubation tube has, within the past two or three years, been employed, together with such criticisms and deductions as our present knowledge warrants of the practical value of the operation in such cases.

The intralaryngeal conditions alluded to, unheard of—unthought of, perhaps—in connection with intubation in the early days of the art, are many, varied, and sometimes even curious. Their number is rapidly extending, as keen observers are attracted to the possibilities and advantages of laryngeal intubation as a substitute for older and more incomplete measures. Still, it must be conceded that the subject is in its infancy and that our experience is not yet such as to give ample and reliable statistics upon which to formulate definite propositions. An essay, then, like the present will, of necessity, consist largely of a compilation of the ascertained facts and deal to a certain extent with much that is problematical or at least not proved, and may serve alone to establish a new point of departure for future and further research. Illustrations of the practicability, at least, of the following propositions are in the majority of instances forthcoming, and their clinical details can be found in our literature; other corroborative cases have been treated at my clinic at the College of Physicians and Surgeons, New York. Where such clinical proof fails, I still offer the proposition in the hope that future research will justify my venture. I have, upon due consideration, thought it desirable to sacrifice these details for the sake of conciseness, and because each case demanding intubation, whatever be the cause, must be treated according to the indications that it individually presents; in other words, precedent will not guide us.

None of the many successes that are reported have been easily won. Patience, ingenuity, manual skill have all been demanded; many failures need to be recorded. The general outcome of our experience, however, is such as to encourage further earnest pursuit of what is clearly attainable.

In my enumeration I shall not pause to discuss the question of intubation in either acute or chronic syphilitic affections of the larynx. I have elsewhere * advanced clinical evidence of its effectiveness and recorded my belief as to its great practical value. Both this evidence and my views have been amply corroborated in the three years that have elapsed since they were presented, and the procedures long since removed from the bounds of a possibility to the domain of an actuality. Nor do I consider it necessary to call attention to the now universally conceded value of intubation in membranous laryngitis further than to recall to recollection that in the adult it has been practiced under the same conditions and with the same brilliant results as in the child—this in many recorded instances.

Professions have recently been advanced, on good authority, of a cure of abductor paralysis of the vocal cords by means of intubation. That relief to the inspiratory dyspnœa may thus be given there can be no question, but that a *cure*, as I understand the word, the restoration of normal physiological abductive or respiratory movements to the vocal cords can thus be obtained, I must doubt; the organic causes alone producing the paralysis would prevent it, were other reasons wanting. This statement applies to chronic cases, or paralyses of long standing; in others, where the inspiratory dyspnœa is dependent upon a paresis of the abductor muscles from commencing acute degenerative processes in them, especially if these are of myopathic origin, or due perhaps to some temporary peripheral lesion, transient pressure upon or slight injury to the recurrent laryngeals, the maintenance, by means of the intubation tubes, of even a small respiratory opening at the glottis may not only avert the immediate performance of tracheotomy, but also stimulate normal physiological movement, and thus preserve muscular nutrition by exciting a certain degree of muscular activity; the experiment is at least

* Intubation of the Larynx in Acute and Chronic Syphilitic Stenosis as a Substitute for Tracheotomy and the Method of Schroetter. A paper read before Section Twelve of the Tenth International Medical Congress in introducing a discussion upon Syphilis of the Upper Air-Passages. *Medical Record*, October 4, 1890.

worth a trial. This latter indication also exists, and I believe has been successfully met, when the tubes were employed early in the case, in those instances where, after a tracheotomy, paresis of the abductors prevented the removal of the tracheal cannula.

Undoubtedly intubation is demanded and will have a certain value in relieving the dyspnœa dependent upon an acute bilateral abductor paralysis of constitutional origin. I have reported two such cases due to syphilis,* in which a cure of the paralysis followed an antisyphilitic treatment. In neither was the dyspnœa of such a grade as to necessitate a tracheotomy; had it been, or should it be in other like cases, intubation would relieve the temporary urgency of difficult respiration and obviate resort to a more formidable operation, aside from affording safety to the patient during the period of iodide administration and the establishment of its physiological and remedial effects.

Aside from these few—too few—instances, I must doubt the efficacy of intubation as a *cure* for bilateral abductor paralysis. There can be no difficulty in passing a tube between the closed but flexible vocal cords; there is no doubt as to the relief of inspiratory dyspnœa while it is in position, but the necessity of the patient's wearing it having arisen, can it again be dispensed with? It then, in chronic cases, becomes a choice between it and the tracheotomy cannula, and for permanent use the latter possesses advantages over the former. In one way alone in such cases can the intubation tube effect a passage, practicable and permanent, at the glottis which will allow of its eventual removal, or of that of a tracheotomy cannula—namely, by causing in the first instance pressure upon the parts most closely constricting it, then an ulcerative process and destruction of tissue, granulation and a molding of the inflammatory products about the tube, their organization and cicatrization following; such a process might eventuate in a cicatricial opening or canal between the now disorganized vocal cords that would remain sufficiently open for the passage of the respiratory current, especially if the process had been aided in the first instance by transverse incision of each vocal cord near its center.

I can not, however, regard such a result, even if attainable, as a cure for abductor paralysis. It could only be reached by long, tedious, and difficult steps; the outcome would always be problematical, and tracheotomy at the outset or the retention of an already existing tracheotomy wound seems to me preferable.

* *New York Medical Journal*, December, 1878.

Turning to another class of cases, where, it may be, a better promise of success is before us: intubation is doubtless indicated in some cases of laryngeal dyspnœa dependent upon abductive immobility of the vocal cords, due to *ankylosis* of the arytænoid articulations from either constitutional causes leading to laryngeal affections or non-suppurative adhesive arthritis due to local inflammatory changes, perhaps to mechanical fixation of the joints, by plastic infiltration of the tissues in their neighborhood, or by cicatrices of the same parts due to injury, typhoid, syphilis, or other ulcerative conditions, all of which bind them in an immobile position. In such instances well-directed pressure by means of a series of graded and even specially shaped intubation tubes will, it is believed, exert—indeed, in one or two reported instances at least has exerted—a favorable influence in promoting absorption of the effused material, or, by forcibly breaking up cicatricial attachments, has freed articular movement. This aside from the relief that the use of the tubes has afforded to respiration and the fact that tracheotomy may thus be avoided.

A novel but very reasonable indication for the use of an intubation tube is as an intralaryngeal splint in cases of fracture and displacement of the laryngeal cartilages due to direct injury. In such instances, after remolding the distorted parts of the cartilages into normal shape and position by external manipulation, the internal use of a large-sized tube will be of service in retaining them there during the process of repair. This retention may be aided by the employment of such external supports and dressings as are indicated under special circumstances.

The intubation in this same class of patients meets a second requirement that commonly arises—namely, acute dyspnœa due to œdematous infiltration or to the development of hæmatomata, usually of the arytæno-epiglottic folds, as has been shown in cases treated at my clinic. Two serious results of fracture of the larynx are thus possibly avoided—the necessity of immediate tracheotomy, and remote distortion or stenosis of the laryngeal cavity.

In chronic stenosis, the outcome of intralaryngeal conditions produced by fracture of cartilages that might perhaps have been averted by the timely and proper employment of the above measure, we have had at our clinic ample illustration of the excellent service rendered by intubation in dilating cicatricial contractions, and even in some measure replacing distorted parts. One such noteworthy result has recently been reported.

Another novel indication may perhaps in the future be successfully met by employing a proper sized and shaped intubation tube in cases of compression of the larynx or upper trachea from external causes, thus maintaining a respiratory passage. It has already been used for this purpose in acute tracheal stenosis caused by the pressure of an acute thyroiditis.

The tubercular larynx does not commend itself for many reasons as a proper site for the sojourn of an intubation tube. Still, the operation of intubation has been successfully performed more than once in laryngeal phthisis for the relief of dyspnœa dependent upon chronic œdema, for perichondritis, and for bilateral abductor paresis due to ankylosis of the arytænoid articulations—in these cases to the exclusion of tracheotomy. Perhaps in the future our experience may lead us to prefer it and to employ it exclusively. Either operation may only be chosen; in extreme cases either can give but temporary relief; to-day it seems to be simply the choice of the lesser of two evils.

In the treatment of the acute inflammatory affections of the adult larynx and their results intubation will play no unimportant *rôle* in the future if we may judge from the brilliant service that it has already rendered in the acute laryngeal diseases of childhood. Acute subglottic laryngitis is rare in the adult, but not unknown. Its symptoms are those of laryngismus stridulus in the child, and the diagnosis as to cause not difficult if the laryngoscope is used. To my knowledge, however, mistakes have been made, the rarity of croup in the adult and the default of a direct examination misleading the attendant into the performance of a tracheotomy in one case and to preparations for it in another. In any instance, in the adult, where the deep-red-colored mucous membrane can be seen to bulge out symmetrically in smooth, rounded masses from beneath the vocal cords, notably encroaching upon the subglottic space; where dyspnœa, sometimes spasmodic, always urgent, demands prompt assistance—intubation affords a reliable means of assured relief.

This is true also in those morbid conditions of the larynx characterized by an extensive and sudden serous infiltration of the loosely attached parts, in which the œdema is the prominent and practically the only local lesion. Ample experience has proved the efficacy of intubation and the fact that it alone may be depended upon when scarification fails to relieve the œdematous parts. The day of tracheotomy in œdema of the glottis has probably passed. In one instance at least, upon record, intubation has been practiced in erysipelas of

the larynx; and the temporary use of the tube, to the exclusion of other and harsher measures, naturally suggests itself as a sensible and practical means of relieving the dyspnœa incident to traumatic laryngitis, especially that due to scalds and burns.

That acute perichondritis, especially of the cricoid and of whatever specific nature, may usually be combated, as far as its most urgent symptom—dyspnœa—is concerned, by the same measure, will, I think, be conceded.

Spasm of the glottis in the adult, usually purely reflex in character and rarely dependent upon any morbid lesion of the nerve centers, an affection involving discomfort and apprehension rather than danger, has in a number of instances upon record imperatively demanded the performance of tracheotomy. It seems to me more reasonable, in view of the temporary necessity for the use of any instrumental aid, to substitute the comparatively simple and safe intubation for the more serious procedure. The former operation has been employed, but unsuccessfully, in a girl for pronounced aphonia spastica.

Among the many chronic affections of the larynx are found at least two conditions in which an intubation is of service in replacing older, more severe, and less perfect measures. First, in that rare form of chronic laryngitis in the adult that develops mainly in the subglottic region and results in certain hypertrophic changes that seriously encroach upon the breathing space. Energetic surgical procedures, usually at last a tracheotomy, have in the past been necessarily practiced to relieve life-destroying dyspnœa. For the future, I believe that progressive intubation, dilatation with partial or even complete resorption of the hyperplastic tissue by means of regulated and directed pressure, will answer the indications and largely supplant all the other surgical operations that experience has so often proved to be ineffectual in opening and maintaining a respiratory passage.

Progressive intubation has been used, so the records show us, in cases of general hypertrophy of the laryngeal mucous membrane and resultant partial stenosis with some measure of success, and certainly played an important part in the result attained by Roaldes in his case of atresia of the larynx dependent upon adhesion of the vocal cords, and general distortion of the laryngeal cavity due to cicatrization following catarrhal ulceration.

It is hardly conceivable, in these days of precision in diagnosis and improved instrumental aids, that a multiple papilloma of the

larynx in the adult would be allowed to attain such a size as to interfere seriously with respiration; still, it might happen; also that proper instruments were not at hand for the endolaryngeal removal of the neoplasm. In this emergency intubation would be preferable to tracheotomy as a temporary means of relief to the dyspnœa and to afford time for other operative steps. Several such cases are recorded as occurring in children, and have been brought to a successful issue by such an expedient.

Two procedures, thus far only employed in the case of children, may have their value in certain rare instances in the adult. The first of these is an intubation with a series of progressively graded tubes, having for its ultimate object either the necrosis or interstitial absorption of the imperfectly organized tissue of the papillomatous growth by continued pressure. I can not believe that such a procedure will ever find general acceptance, being far inferior, both in intent and execution, to several other well-recognized and more effectual instrumental means of removal.

The second suggestion concerns the employment of large, thin-walled cylindrical intubation tubes as an aid in the removal of difficult laryngeal neoplasms. Each tube is provided with an appropriate fenestra that looks toward the exact site of the growth. The tube introduced, the growth should appear within the fenestra, and is then removed from the lumen of the tube by forceps, curette, etc., without chance of injury to surrounding parts. It appears upon the mere reading that such a procedure might be of service in affording protection in those cases of broad, sessile growths, firmly incorporated with the underlying tissues that are so difficult of radical extirpation, and where, for instance, thorough and deep curettement is necessary.

Still more promising does it seem as an aid in the removal of neoplasms located in the subglottic region, one notoriously difficult of access. The separation and immobility of the vocal cords, secured by the introduction of the large fenestrated tube between them, the location of the exact site of the growth with the assistance of said fenestra, perhaps its direct presentation within it, should theoretically render what has always been a serious operation a more practicable and easier one. It should be added that it will require a practiced and skillful hand.

Cases occur in which small foreign bodies lodge in the larynx—small enough to pass the lumen of a special intubation tube of large caliber, yet large enough to cause by their presence laryngeal dysp-

nœa, either immediately by reflex spasm or remotely from œdema and swelling, the dyspnœa being urgent enough to indicate a tracheotomy, but in which, as experience has shown, intubation answers every purpose, as follows: Either the foreign body is dislodged upon the mouth of the tube during its introduction and is at once expelled through it, or it is pushed from the larynx into the trachea, and thence, being loose, is expelled through the tube by violent coughing.

In other cases where the foreign body is large enough to dangerously occlude the glottis, too large to pass through the intubation tube, suffocation imminent, and for any reason tracheotomy not immediately available, I believe that intubation is indicated to gain time and obviate a pressing necessity, when it is a possibility to insert the tube through the larynx and past the foreign body.

It has been suggested that intubation will be effectual in preventing the dangerous results of reflex laryngeal spasm when the foreign body in the air-passage is of a fluid character; blood, for instance, passing suddenly and in large quantity into the trachea in pulmonary hæmorrhage, operations upon the mouth, throat, etc., provokes reflex spasm in its violent but ineffectual efforts to pass quickly in large volume through the larynx, and asphyxia ensues from its fatal accumulation in the trachea and bronchi. The temporary use of a large-sized tube would prevent the excitement of such laryngeal spasm by affording a free and unimpeded exit for the collection of fluid in the trachea.

My enumeration of suitable or probable good causes for an intubation must now include those so-called obstacles to the removal of a tracheotomy cannula that experience shows us not uncommonly occur when its withdrawal has been unduly delayed to a time long subsequent to the infliction of the tracheal wound. A study of the nature of these obstacles is sufficient to render at least reasonable the suggestion that we have in the intubation tube a means of overcoming many of them, and the theory has been verified in practice in some instances.

When dyspnœa is dependent upon a stenosis caused by excessive granulation tissue springing from the upper borders of the laryngotomy or tracheotomy wound and filling the lower larynx or upper trachea, or when inflammatory swelling or hyperplastic hypertrophy of the laryngeal mucous membrane below the glottis and above the limits of the wound into the air-passage exists, intubation surely will

be of service; its good results have been already recorded in our literature.

Cases in which a cicatricial stenosis or a membranous web has developed, either at the site of the original incision, at some point above it, or in the trachea itself, as a result of undue pressure by the cannula, likewise present a suitable indication for the operation.

The question as to the value of intubation in overcoming the obstacle to the removal of the tracheotomy tube presented by the bilateral-abductor paresis that may be a sequel to the operation has been elsewhere mentioned in this paper.

Finally, I raise the query as to the possible service of an intubation in those curious, often unexplainable cases of inspiratory spasm that usually immediately, perhaps remotely, follow the attempted removal of the cannula.

In the three years that have elapsed since my paper on intubation in the adult larynx in syphilis was read at Berlin * no valuable modifications in the technique of the operation there described have been offered and no changes in the armamentarium suggested that are of any great importance. Both the theory and the practice of the art then remain practically the same, and I need occupy no time in repetition of what is already both known and conceded. My further experience has taught me that some boldness in the treatment of acute cases of laryngeal stenosis, a ripened judgment in the proper selection of chronic ones, the acquirement of considerable manual skill in the use of instruments, a competent knowledge, alone taught by practice, as to the use and change of suitable tubes, and, finally, both patience and persistence, are all needed to crown intubation with success. Just in proportion as these qualifications are forthcoming will the statistics of the operation improve in times to come. What I have written concerning the indications for the use of the intubation tubes in the adult is based solely upon the knowledge of to-day.

My summary is by no means conclusive; it will, I believe, be materially increased in the future as new indications present themselves; it will also need some modification, as certain indications are discarded as being impracticable of fulfillment. Meanwhile the need is for a larger collection of facts well observed by many persons. It has been shown that deductions drawn from the few at present at our disposal can not in many instances be regarded as con-

* Intubation of the Larynx in Acute and Chronic Syphilitic Stenosis, p. 19 *et seq.* Reprint from the *Medical Record*, October 4, 1896.

clusive. New facts, therefore, are desirable, and, widely discussed, tested, and, if possible, proved, must lead to advancement both in the science and in the art of adult intubation. To direct attention to this present need of increased observation, to record the known and encourage research for the unknown, has been the purpose of this essay.

Discussion.

Dr. W. K. Simpson: I have had considerable experience with adult intubation. The subject has been so thoroughly covered by Dr. Lefferts that there is little to add. The instruments employed in intubation, both for children and adults, are the result of years of experimentation before they were brought to public notice. Every attempt that will be made to modify the intubation tubes has already been gone over. A slight modification has been made in the lower aspect of the smaller tubes, it having been broadened somewhat.

The technique of the operation in adults differs somewhat from the technique of the operation in children. We have a different type of cases to deal with. We must remember that in the adult the epiglottis is much further away from the finger and is more difficult to hold in position. In cases where a tracheal cannula is worn, when we attempt to introduce the finger, we receive no aid from the elevation of the larynx. The instrument in the adult is best introduced by the use of the mirror. In children it is introduced through the sense of touch. In the adult the parts can be sprayed with cocaine, and then, with the mirror in the left hand and the instrument in the right hand, the latter is introduced and you can see it enter the larynx. This is a much better plan than to try to introduce it blindly, as we do in children. Its removal also is much better accomplished by the aid of the mirror.

I was not familiar with the fact that the statement had been made that intubation in the adult could be employed as a means of curing abductor paralysis of the cords in the fullest meaning. I have seen it suggested, however, that such a condition might be improved by this procedure, as the tube would produce a certain amount of pressure and would tire out the tendency to muscular spasm. I have employed the intubation tube in a case of fracture of the larynx with very good results.

Dr. Roe: I have listened to Dr. Lefferts's paper with much interest. I have had some little experience with adult intubation, and have published one case of syphilitic gummata of the larynx in which it was employed where the dyspnœa was so pronounced, and had been for two days, that the patient was well-nigh exhausted. This case I saw two years ago last February, reported it to the Central New York Medical Association the following June, and published it in the *Buffalo Medical and Surgical Journal* for July, 1891. As some of you may not have seen the report, and as it was an exceedingly interesting case, I will briefly

relate it: The patient, a woman, had been treated by an irregular practitioner for some time for "catarrh." Her gradually increasing dyspnœa, however, soon became so great that a regular practitioner was called and I was sent for to see her in consultation. Finding the patient in an almost breathless condition, I introduced by the aid of the mirror a laryngeal tube, which gave instant relief. The extreme stenosis in this case was caused by a gumma located under the left vocal cord, and pressing it upward and over against the opposite cord. The woman was at once placed on active antisyphilitic treatment, and on the fourth day the gumma had so much subsided that she coughed out the tube, and, as the breathing was quite free, it required no reintroduction.

I have also practiced intubation in one case of tubercular laryngitis associated with pulmonary tuberculosis. The patient was a young lady twenty-two years old. The infiltration and chronic inflammation of the larynx had caused an ankylosis of the arytænoid articulations. The cords were immovable and so closely adducted as to cause urgent dyspnœa. I saw no way of relieving the dyspnœa except by intubation or tracheotomy. The former operation was decided on, and at once gave relief. After a time the tube caused so much irritation that I had to remove it, but it had so dilated the larynx that for two or three days breathing was quite free. When the dyspnœa returned, the tube was reintroduced, but could only be retained for a short time, owing to the irritation and cough excited. I was then obliged to do tracheotomy, but the patient died soon after from pulmonary tuberculosis. This is the only case in which I have performed intubation when there was a tuberculous condition of the larynx. It is not well adapted for these cases, owing to the irritable and sensitive condition of the larynx, although it may be of special service in relieving impending suffocation and permitting the employment of thorough curettement and the application of lactic acid to the infiltrated tubercular tissue, or when the means for performing tracheotomy are not at hand.

Dr. Delavan: I was very glad to hear Dr. Lefferts emphasize the importance of special skill in the performance of intubation. I believe that a man who has intubated but two or three times will not by any means get the good results that Dr. O'Dwyer and other experts in this line have obtained. The insertion of these tubes takes long practice, and the preference should be given to the man who has had the most experience and who has the best-educated touch.

Dr. Lefferts: Dr. Delavan's remarks are timely and to the point. I have alluded in my paper to the importance of the trained hand in performing intubation.

In reply to Dr. Simpson's remarks regarding adult intubation, I would state that I spoke of the technique of the operation in my paper read three years ago, fully covering every one of the points mentioned.

Regarding the use of the word "cure," which has been criticised in connection with the treatment of bilateral abductor paralysis by means

of intubation, I would say that I have heard and seen that word repeatedly used, and I saw fit in my paper to criticise it adversely. It has been said that a cure of such paralysis can be made by means of intubation tubes. I do not believe that this is possible.

Paper.

LARYNGITIS HIEMALIS.

By J. C. MULHALL, M. D.

DURING the last twelve years I have written notes in my case-books of nine cases of an affection of the larynx in which there existed such a uniformity of signs and symptoms peculiar alone to this disease, and as yet, to my knowledge, unwritten about, that I have thought it worthy of the special title under which I beg leave to present it for your consideration.

It is simply a variety of subacute catarrhal laryngitis, in which the secretions are, *ab initio*, adhesive crusts, mechanically producing dysphonia, more often complete aphonia, and occurring *alone during winter*. I have adopted the term "winter" laryngitis for the following reasons: I have never seen the disease except in winter. In several of these selfsame patients, who have had attacks of laryngitis in summer, the crust formation has not occurred, aphonia was absent—in a word, it pursued the ordinary course of a non-febrile, subacute laryngitis. Two of my patients, completely aphonic, having been sent to the warm, moist air of Florida, lost all traces of the affection—one within forty-eight hours, and one within a week after arrival in that State. One of them being compelled to return to St. Louis before our cold weather had ceased, was, on the second day of her return, seized with her former laryngeal symptoms. I have had several such experiences as the following: The patient enters the consulting room completely aphonic. With a warm salt-water laryngeal spray, all crusts having been detached and coughed out, the voice has at once returned more or less pure. On the following day the patient has returned with the intelligence that within two hours after leaving the office the voice had again become lost. On the appearance of several successive days of warm weather in the winter these cases have rapidly improved. It therefore seems to me that continued cold weather is the important factor—the exciting cause.

The predisposing factor—that which causes the larynx to yield this perverted secretion—is as much a mystery to me as the foul perspiration of certain individuals otherwise healthy. I have found it associated with no particular diathesis, age, occupation, unhygienic surrounding or *personnel*, or faulty condition of other bodily organ, including the nose.

The crusts adhere more closely to the true than the false cords, cling with great tenacity to the inter-arytænoid fold, and are often found on the under surface of the true cords. In St. Louis they are often black, being thus discolored by the soot-laden atmosphere. The evidences of inflammation in the larynx are usually quite slight, and I have often been surprised, after having cleansed the larynx, to see the true cords white and without suspicion of erosion or thickening. In one patient, however—a saloon keeper, a slave to alcoholic and other excesses, utterly careless as to the quality of his voice, and who would only apply for treatment when he had been quite aphonic for a week or two—a general laryngeal thickening has taken place and he is dysphonic even in summer, though no crusts are ever present in this season. Each winter, however, with the first appearance of cold weather, the crust formation occurs. The aphonia and dysphonia are mechanical, the crusts preventing cord vibration and approximation, and these symptoms alone cause the sufferer to seek relief. The tickling cough is but slight, and the patient soon learns the futility of attempting to clear the throat by forced coughing, rasping, and hawking, and soon ceases these efforts.

The disease may be acute and last but two or three weeks, but may readily, without appropriate treatment, last the entire winter. It may occur but once in the lifetime of a patient, or may be a relapsing disease. It may occur with the first fall of the thermometer to 30° F., even without the precipitating factor, "catching cold." In two such cases I have not been able to satisfy myself with the laryngoscope that any inflammation whatever existed.

One not familiar with this clinical picture—for it is rare—might suggest that this is but a variety of the well-known "laryngitis sicca." This latter is, however, nearly always associated with pharyngitis sicca or rhinitis atrophica, being *sequential* to these conditions. It is essentially a chronic disease, the secretions often fetid, and is merely modified by climatic conditions. In the cases I have described there is associated no other bodily ailment.

The milder often readily yield completely to treatment. I have found hygiene, both in the cure and prophylaxis, of most importance,

such as the wearing of light woolen undergarments, thick-soled shoes, without rubbers; the avoidance of overheated apartments, especially furnace-heated houses; the sleeping in a cold room, cold-water sponging, silence in the open air, avoidance of stimulants, careful dieting, etc.

Locally, after having first cleansed the larynx, I have found a cold spray of vaseline and eucalyptol, ten minims to the ounce, two drachms to be used at a sitting, of most service. The cold, wet throat pack at night and the internal use of muriate of pilocarpine, combined with muriate of ammonia, complete what I have found to be of service.

Paper.

RHINITIS ŒDEMATOSA.

By J. C. MULHALL, M. D.

SOME years ago a patient entered my consulting room desiring relief from obstructed nasal breathing. I saw nothing abnormal anteriorly, but posteriorly saw what I hastily concluded was a large, soft polypus projecting from the right nostril. I acquainted the patient with my diagnosis, and requested his return on the following day for operation. He complied, when, to my discomfiture, I saw nothing in either nostril to remove. I acknowledged my error, and began to ask questions—a proceeding I had disdained on the previous day. I then learned that the obstruction was intermittent, sometimes bilateral, again unilateral, sometimes completely absent. The discharge was scanty and purely serous. This was my first knowledge of such a nasal disorder.

I have seen since then six cases. It consists of an infiltration of pure serum into the connective tissue overlying the inferior and middle turbinate bones. It may be general or limited. For example, in a case seen by Dr. Glasgow and myself, the œdema was limited to the posterior half of the left middle turbinate, projected into the pharynx, resembled very much a cyst, and caused intense pain, lacrymation, and a flow of acrid, thin serum. The œdema is sometimes migratory. It may affect exclusively the anterior end of a middle turbinate to-day, disappear in a day or two, and reappear at the posterior end of the inferior turbinate. The discharge is usually slight and consists of limpid serum. It may be acute or chronic, the latter causing little suffering beyond that incident to

obstructed nasal breathing. In appearance, when confined to a small area, it strikingly resembles a recent myxoma, especially when situated about the hiatus semilunaris or olfactory fissure; and even since my original experience I have been for a moment deceived. The probe, however, soon dissipates doubt. Unlike other vaso-motor troubles in the nose, it is unaffected by cocaine. When punctured with a bistoury it very slowly yields serum. The incision heals very rapidly, and the parts can not be drained in this way. It may occur, as it did in two of my cases, in connection with bronchial asthma. Its exact relationship I have not been able to determine. I have one patient in whom I have seen it coincident with the asthma. Yet I have seen the same patient suffering asthma without nasal œdema, and also suffering nasal œdema without asthma. In this patient, therefore, one may feel sure that there is a causative element common to both, selecting both vaso-motor areas—the nose and bronchi—at one time, or but one, according to the intensity of the exciting cause. In the other four cases asthma was never present. In one case the nasal œdema was chronic and unilateral; bronchial spasm of mild degree nearly always present, varied by occasional nocturnal paroxysms of great severity. The disease is certainly a neurosis, and yet stands quite apart from that class of cases where the precipitating factor is from without—such as rose cold, hay fever, ipecac or animal asthma, and the like diseases, where the reflex cycle commences in the nose. Again, it has nothing in common with that form of vaso-motor coryza characterized by sneezing, the profuse discharge of serum, often a pallid mucous membrane, occurring independently of season, occupation, or surrounding; often lasting years and readily controlled, though not cured, by a system of treatment addressed to the sympathetic system of nerves. In rhinitis œdematosa this treatment has been of no avail. It seems to me almost certain that the exciting cause is from within, and most probably intestinal ptomaines form the chemical irritant to the sympathetic nervous system.

In two cases of acute migratory œdema the affection was coincident with a mild degree of icterus, and when the jaundice had disappeared and all treatment was directed to this end, no local treatment whatsoever having been instituted, the nasal œdema disappeared. These two cases had never before had nasal disease of any kind. In three cases of relapsing œdematous rhinitis complicated with bronchial asthma there existed the group of symptoms familiarly known as biliousness. When, by treatment directed to the

correction of this condition, the urine and fæces had resumed their normal color and quantity, the tongue had become clean, intestinal fermentation had ceased, the appetite had returned—in a word, the alimentary canal had resumed its normal function—the asthma and nasal œdema disappeared. Relapses were always accompanied by the digestive disorder.

From analogy, since we call the one peptic asthma, we might also speak of peptic œdema. I therefore believe this disease to be always of systemic, mostly of biliary origin.

Does a predisposing factor exist by virtue of abnormal contact points in the nose? In the acute cases neither hypertrophy, deviated bone, nor cartilage were found. In two chronic relapsing cases deviations of the sæptum were rectified, without, however, preventing relapses. In one the patient was entirely free from asthma and nasal œdema for six months—a longer period of immunity than he had enjoyed in ten years—but relapse finally occurred.

Anatomically considered, one might expect nasal œdema in Bright's disease, but, though I have examined not less than fifty cases of chronic nephritis to this end, I have yet to see such a case. I was therefore not surprised to find in these cases no evidence of kidney trouble. It occurred at no special season of the year, exhibited no peculiarities with regard to social conditions, sex, or age, except that I saw no case in children. The atmospheric factor plays a part. In the case of the lady, wife of an army officer, seen with Dr. Glasgow, her two attacks, three years apart, coincided with removal to St. Louis on both occasions. She quickly recovered after leaving St. Louis. In two cases permanent relief from asthma and nasal œdema followed permanent residence in southern California. Some atmospheric factor, plus deranged digestion, plus central instability, plus a hyperæsthetic nose, probably unite in the ætiology of a single case. In the treatment the one great thing not to do is to spray the nose. Even a weak spray of cocaine, or vaseline variously medicated, aggravates instead of helping. All local treatment, except perhaps scarification, should be avoided. This is especially true of the acute cases. In chronic cases I should regard it good practice to correct nasal abnormity. All efforts should be addressed to correcting the depraved condition of the alimentary canal. Intelligent dietetics, hydrotherapy, well-ordained physical exercise, massage, nerve rest, and the avoidance of drugs, form the basis of treatment.

Discussion.

Dr. E. L. Shurly, of Detroit: In regard to the second of Dr. Mulhall's papers, I think we shall all agree that the condition he refers to is a systemic affection, and is the result of what is known as "a cold," which may be due to malaria or some other bodily disturbance. It is a very common occurrence in emphysematous patients, or in the plethoric or obese. I have never regarded it as a local affection. I think it depends principally upon some irritation of the ganglionic nervous system.

In his first paper Dr. Mulhall's has described purely laryngitis sicca, which, however, is not always accompanied by pharyngitis sicca. This is not particularly a disease of cold weather, for I have frequently observed it at all seasons, in young girls, especially in those who are taking music lessons; although seeming to be tolerably healthy, it will be found often that they have some derangement of the function of menstruation, or that they have been "crowded" by their work, or are too ambitious, seeking to do more than their nervous system can sustain. In these cases I have not found any signs of atrophic rhinitis —excepting once or twice. It always occurred to me that such were cases of "laryngitis sicca," and that the ætiology must be looked for in the general system. Local treatment does some good undoubtedly, but not very much. The restriction of work, and the use internally of phosphorus and iron, seems to do these cases the most good. Of all the local treatment, I have obtained the best results from the use of a mild spray composed of oil of tar and albolene, and electricity.

Dr. J. Wright, of Brooklyn: I quite agree with the previous speakers as regards the constitutional origin of rhinitis œdematosa, but at the same time it is a very rare thing, in my experience, to find this condition as purely the result of systemic disturbance, without some thickening of the nasal mucous membrane—some chronic rhinitis. Of course, the principal factor is the constitutional one; but when this thickening does exist, I have found that the best thing to do is to apply the cautery to the inferior and middle turbinated bodies. In other cases I do not think the local treatment is of any value.

Dr. C. C. Rice, of New York: I do not think that here in New York we are familiar with the variety of laryngitis that Dr. Mulhall speaks of —that is, laryngitis characterized by collections of dry scabby secretions in the larynx and independent of pharyngeal disorder. In my experience, such disease of the larynx is always secondary to nasal or pharyngeal trouble. I can not recall a single case in which I did not find some morbid condition of the mucous membrane higher up, beginning in the postnasal space and running down the posterior wall of the pharynx. The few exceptions to this general rule are those cases in which the disturbance in the larynx is out of proportion to that in the pharynx, owing to some peculiar exciting cause, such as is to be found in singers, actors, etc., who use their voices in an unusual way. We know that the exacerba-

tions in pharyngitis sicca and atrophic rhinitis are more likely to occur in cold weather. Laryngeal disorder, independent of some pharyngeal disorder, I am not familiar with.

Dr. Casselberry: I would support Dr. Mulhall's position regarding the independence of what he has termed "winter laryngitis." I can hardly accept that term, however, inasmuch as I have observed the same form of disease in Chicago at various times during the year. It has impressed me as a laryngitis sicca acuta—an acute form of laryngitis with deficient secretion. I have often been astonished at the amount of dry incrustation and the absolute aphonia at one moment and the comparatively good voice the next moment when the crusts were cleared off. I have observed it in patients who were comparatively free from nasal or pharyngeal disease. I say comparatively free because we rarely see anybody in Chicago who is absolutely free from nasal and pharyngeal disease. The patients referred to are those who suffer from what we call an acute cold, in which the brunt of the disease is borne by the larynx; usually, however, there is also acute pharyngitis and rhinitis of mild form, which is not the cause of the laryngitis in this instance, but simply an unimportant accompaniment.

Concerning rhinitis œdematosa, I was struck with the aptness of this title, and believe the cases reported by Dr. Mulhall are closely allied to that œdematous condition of the nasal mucosa which is associated with and which seems to underlie the formation of nasal myxomata, and which is also seen in association with bronchial asthma. Not that the asthma is caused by the nasal œdema, but that the two conditions are simultaneous manifestations of the same vaso-motor paresis affecting the blood-vessels of the mucosa of both the nasal and bronchial tracts. I have observed also what may be an allied but not identical neurosis affecting the anterior ends of the inferior turbinated bodies. The particular case which is recalled to my mind consisted of a protrusion of the tissue of one or both inferior turbinated bodies—at times actually a half to three quarters of an inch outside the anterior nasal orifice. The membrane would protrude and again collapse by spells; when collapsed, being entirely withdrawn into the nasal chamber.

Dr. H. L. Swain, of New Haven: The gentlemen who have spoken about laryngitis hiemalis have come from soot-laden cities. In New Haven we also have something which corresponds to the description given by Dr. Mulhall. We burn no soft coal, therefore that can not be considered as a factor in the production of the disease. I myself am a victim of it, so I can speak with considerable authority. So far as my experience goes, I have never had it except in cold weather; I have no pharyngitis sicca; I have slight hypertrophic rhinitis. This past winter I had two patients similarly afflicted at the same time as myself. They were both university men, who were using their voices considerably in delivering lectures, and at that time I myself was straining my voice delivering lectures and attending to a heavy line of professional work

The weather was intensely cold. I am therefore inclined to agree with Dr. Mulhall in his remarks as to the ætiology of the disease. I have had this same trouble at the same season during three consecutive years, and am inclined to believe that it is partly due to overwork.

In regard to rhinitis œdematosa, we also have such cases in New Haven, and I have this year been attending a patient who has these attacks in connection with bronchial asthma. At the times when the swelling takes place the bronchial asthma is of extreme severity, and I have been unable to control it by treatment applied to the nose. I have frequently made appointments with this patient to cauterize the nose, and then found nothing there to cauterize. At other times I have cauterized existing hypertrophies, removed the spurs from the septum and tried to improve the general health, with a view to correcting the disturbance of the sympathetic nerves, and still the patient is subject to these same attacks if she goes out of town. While she remains in New Haven she does not have them, but when she comes to New York she invariably has an attack of œdematous swelling upon returning home.

Dr. F. I. Knight, of Boston: I certainly can say that in the vicinity of Boston we meet with the form of laryngitis which Dr. Mulhall has described. The patients return to the hospital with the same complaint winter after winter, and I have met with them also in private practice. Of course, the form of laryngitis which is associated with atrophic disease above is more common, and that we are all familiar with, but I certainly have seen a good many cases where there was no evidence at all of anything in the nose or pharynx which could be considered a factor in the production of the disease. In the hospital cases, in my experience, there has been a good deal of thickening of the anterior surface of the posterior wall, where the secretion is prone to collect and dry, as well as on the cords, and here it furnishes an additional mechanical obstruction to the proper movements of the cords, producing aphonia in the morning, and later in the day simply more or less hoarseness. These cases occur in the winter; I do not know that I have ever seen a case in summer. The treatment that I have found most effective in these chronic, constantly recurring cases is a solution of silver nitrate, applied in varying strengths, and gradually increased to thirty or forty grains to the ounce. This has seemed more effective than any other treatment, and I have tried almost everything.

Dr. A. B. Thrasher, of Cincinnati: I think I can say, without an undue exhibition of personal pride, that I practice in a city the atmosphere of which is more filled with coal dust than any other in America. I have never seen this particular form of laryngitis unaccompanied by an inflammatory condition of the pharyngeal mucosa and also of the nasal mucous membrane. Almost invariably, in my experience, it has been produced by either an extension of the inflammation downward, or by an improper condition of the air when it enters the larynx, on account of mouth-breathing, or an inflamed condition of the upper air tract. Nor have I

noticed it to be confined especially to cold weather. I have seen this condition of laryngitis sicca present in summer.

Dr. J. W. Gleitsmann, of New York: I must confess that I am inclined to take the same position as Dr. Rice in the discussion of this subject, as I have never seen cases of laryngitis sicca without coexisting symptoms in the throat and nose. I have seen patients who have been under treatment for some time, and in whom the pharyngeal and nasal symptoms have disappeared, leaving behind that condition of the larynx which has been described here, and which approaches the condition of laryngitis sicca.

Dr. J. W. Farlow, of Boston: I have never seen a case where there was not a dry condition of the nose, the nose being more open than it should be, and the morbid condition extending down into the larynx and pharynx. The hardened secretions are attached to one or both cords. I have had good success in treating these cases with oily preparations, which I consider fully as efficient as silver nitrate; at any rate, they should follow the use of the nitrate.

Dr. W. C. Glasgow, of St. Louis: I did not hear the first part of Dr. Mulhall's paper, but from what I heard it struck me that the cases he reported were similar to the cases reported to this association by me at the Detroit meeting in 1885. Those cases were characterized by intense swelling, with great pallor of the mucous membrane and a discharge of livid serum. One case was typical. The patient was a man; he suffered with facial neuralgia and had the condition of the nose described above. The mucous membrane was white, discharging freely, and the nasal obstruction was marked. When the mucous membrane was touched, there was a fresh discharge of serum. There was intense pain on that side of the face. The nasal disturbance subsided without treatment when the neuralgia disappeared. I regarded this condition simply as a neurosis, and entirely independent of any local lesion. There was also in another case a certain amount of nasal thickening, with retention of secretion, which seemed to keep up the irritation, but, on the whole, I believed it to be strictly a neurosis. I also think that in bronchial asthma we have a similar condition of the bronchial mucous membrane that we have in the nasal membrane in these cases—a vaso-motor spasm of the arterioles of the mucous membrane, and an exudation into the membrane of the fluids of the blood. I base this theory upon the action of the nitrites and other drugs which give relief in asthma, and which are known as arterial dilators. In the treatment of these cases cocaine was absolutely useless. The only remedies that seemed to relieve them were the preparations of belladonna, morphine, and the nitrites.

Dr. S. W. Langmaid, of Boston: One word about the cases of laryngitis with incrustation of the cords. I can not help thinking that the presence or absence of these crusts depends somewhat on the locality in which the patient resides. During my summer term at the hospital these cases are not common, and in private practice I have found them very

uncommon. I agree with the gentleman—Dr. Shurly, I think it was—who said that he had often seen this condition in young girls.

Dr. Mulhall: The discussion in regard to winter laryngitis reveals two camps. It occurs to me that certain members have never seen the disease. Every one present is familiar with the ordinary laryngitis sicca, complicated with trouble in the upper air passages. It seems to me that the personal testimony of a member of this association, who is himself afflicted with this winter laryngitis, exactly as I have described it, should convince the gentlemen that such a disease exists, especially as other members have also observed this form of laryngitis, without any affection of the upper air passages. I accept the suggestion made by Dr. Casselberry to add the word "acute" to the title. This disease, as the doctor said, might be better called acute winter laryngitis, because it seldom becomes chronic. It is a condition which rapidly gets better, especially under vigorous treatment. The disease disappears when the patient removes to a warm climate. The form of laryngitis referred to by Dr. Rice and Dr. Gleitsmann is the one described in all text-books—the one with which we are all familiar. That form which I present has never to my knowledge been described. I mention the smoke not as a causative agent in producing this form of laryngitis, but as producing the color of the crusts. The crusts were black simply from the inhalation of soot. I do not think that an atmosphere laden with coal dust has anything to do with the production of the disease.

Some of the gentlemen confounded rhinitis œdematosa with another group of vaso-motor disturbances, rhinorrhœa, with chronic thickening of the nasal mucous membrane. In the condition I described the swelling is purely œdematous; it has nothing to do with the intumescent form mentioned by Dr. Casselberry. I have never read Dr. Glasgow's paper to which he referred, and do not know whether these cases are the same as those he described. Before leaving St. Louis I mentioned the fact to him in his office that I expected to read a paper on this subject, and he did not call my attention to his paper. From Dr. Thrasher's remarks I infer that he has not seen the class of cases to which I refer. They are exceedingly uncommon.

Paper.

A CASE OF NASAL POLYPUS PROJECTING INTO THE NASO-PHARYNX. WITH SPECIMENS.

By SAMUEL JOHNSTON, M. D.

THE patient from whom these specimens were removed was sixty years of age.

She consulted me with a history, briefly, of nasal obstruction, difficulty in swallowing, and impaired voice production. For many years previous to the onset of these symptoms she had suffered from catarrh, but had never had epistaxis.

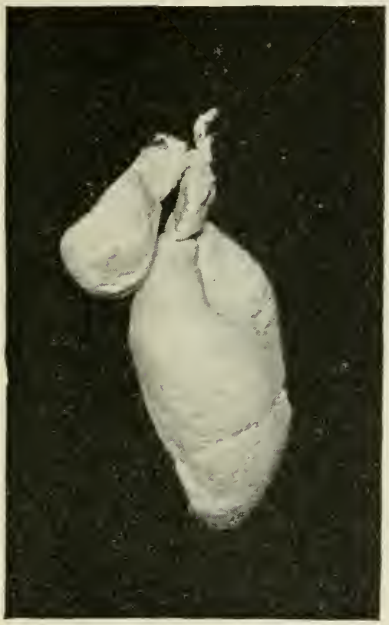


Fig. 1.—Side view of the polypus.

Fig. 2.—Front view.

Several reflexes were present, notably asthma, and her distress was indescribable.

Upon anterior rhinoscopy, the right nostril was seen to be occluded at its posterior opening, the left one being pervious.

On inspecting the mouth, a tumor of unusual size, grayish in color, non-vascular, and firm to the touch, was observed to protrude between the border of the soft palate and the post-pharyngeal wall.

When vocalization was attempted, the growth disappeared into the naso-pharynx, pushing forward the velum.

After removal with the snare, the growth was found to be of about the size of a pullet's egg, slightly flattened, with a smaller one adjoining,

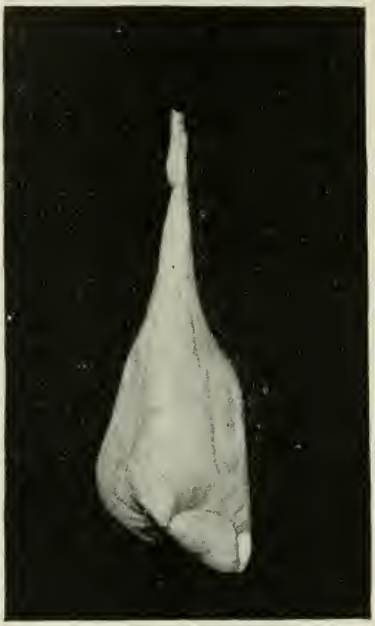


FIG. 3.—Recurrent growth.

and was seen, upon examination, to have had its attachment by a narrow pedicle to the inferior turbinated bone.

A year later the patient returned with a train of symptoms similar to those presented on the first occasion, though not so pronounced. Examination revealed a mucous polypus hanging freely over the velum, almost touching the base of the tongue. The gross appearances of this growth were quite in contrast to those of the first one.

The tumor measured two inches in length and three quarters of an inch at its thickest part.

Polypi having their origin in the nasal passages and growing posteriorly to the size of these specimens are uncommon in my experience, and I have thought them not unworthy of presenting to the association.

Paper.

TWO CASES OF NASAL TUBERCULOSIS.

By JOHN W. FARLOW, M. D.

CASE I.—Mrs. A., twenty-three years of age, consulted me a year ago with the history of considerable discharge in the post-nasal space, and a frequent blocking of the left nostril by large crusts, tendency to bleed from the same nostril, hard, dry cough, and headache in the region of the posterior fontanelle. Putting the finger into the left nostril and touching a sore spot caused pain to be felt in the top of the head, where the headache was generally located.

There was a shallow, elongated ulceration of the lower and anterior part of the left septum. The mucous membrane seemed thick and infiltrated, and the ulcer was covered with a thin, yellowish-gray secretion. It was fully an inch in length, and about a quarter of an inch wide in the center. The upper part of the nostril was blocked by an easily-bleeding, irregular, reddish mass, about the size of a cherry stone, which seemed to spring from the under side of the middle or upper side of the inferior turbinated bone. On account of the profuse bleeding, I was unable to determine this point, but in a few days I saw that the attachment was to the upper part of the inferior turbinate.

There was nothing abnormal in the right nostril or post-nasal space. There was considerable hypertrophy at the base of the tongue, and swelling and redness of the arytænoids, such as suggests tuberculosis. Examination of the chest was negative. There was not much of any expectoration, and examination of the crusts from the nose failed to show any bacilli. There was no specific history, and specific treatment did not influence the case.

Astringent applications reduced the vascular mass, and there remained a marked ulceration of the inner edge of the lower turbinate. This was shallow, irregular, with a reddened edge, and the secretion which formed on it tended to harden into a good-sized crust.

Curette, lactic acid, and cautery were used on both ulcers, and after a while that on the septum entirely healed, and has not formed again in the last four or five months. That on the inferior turbinate has been more obstinate, and, although nearly healed, manifests a tendency to reappear in a new place. The headache has continued with occasional intermissions. Careful examination of eyes, ears, etc., and all sorts of local and general treatment, have failed to give a clew to the cause or bring about any relief.

Case II.—Mrs. B., aged seventy-one years, in unusually robust health, consulted the late Dr. Hooper for a soft, obstructive growth of the right nostril. There was no pain or discharge. About a teaspoonful of soft

tissue was removed by the snare and otherwise, and considerable hæmorrhage resulted. Microscopical examination of the growth showed it to be tubercular. There had existed a curious eruption of the left side of the face, the nature of which Dr. J. C. White was unable to make out.

I saw her a few months ago, and found a soft, reddish mass projecting from the anterior part of the right septum and occluding the nostril. There was a less degree of bulging and thickening of the septum toward the left nostril. The rest of the nose, post-nasal space, and larynx were unusually healthy. There was no cough, and the only symptom was the occlusion of the right nostril.

With the cautery and a snare I have removed the growths from both sides of the septum, and curetted and cauterized whatever irregularities remained. The septum is perforated, and there are still some few places which will need further treatment.

SEARS LABORATORY, HARVARD MEDICAL SCHOOL,
BOSTON, MASS., *May 22, 1893.*

DEAR DOCTOR: The specimen from the case of Mrs. ——— was a small, flat, nodular growth, quite soft, and of a grayish-white color.

Microscopic examination showed it to be made up of numerous small, rounded centers composed of round and epithelioid cells, scattered among which were numerous giant cells. The centers of these masses had undergone a cheesy degeneration.

The structure was in every way similar to that of miliary tubercle.

A number of sections were stained for tubercle bacilli; but there were none found in those examined.

Yours very truly, W. T. WHITNEY.

J. W. FARLOW, M. D.

The growth was examined microscopically and pronounced by Dr. Whitney and Dr. Councilman to be undoubted tuberculosis. Dr. Whitney remarked that it was unusual for so large a tuberculous mass to project on to a mucous surface and not ulcerate. No ulceration existed when I first saw her.

Dr. White has recently decided that the eruption on the face is probably tuberculous and it has much improved when treated locally with that diagnosis in mind.

The nose is certainly not a favorite place for the growth of the bacillus of tuberculosis and very few cases of its occurrence are reported. Two forms are generally described—the ulcerating and the proliferating, with increased new growth. My second case belongs to the latter class. There was an infiltration with tubercular elements and resulting enlargement of the septum sufficient to occlude a good-sized nostril, but no ulceration or discharge.

The first case is a chronic, obstinate ulceration of the septum

and inferior turbinate, with a soft, vascular, hypertrophied mass springing from the inferior turbinate, of low vitality. Although not confirmed by microscopic diagnosis, I think I am justified in calling it tuberculosis. This did not have the form of the common ulcer of the sæptum, but was long and narrow, extending nearly half the length of the septum. There was no history or sign of specific disease, and specific treatment was of no avail. Ulcerations of the turbinate are very uncommon, and in this case, following upon the soft vascular growth, were unlike anything I had seen before. Calling such cases scrofulous or lupoid is only begging the question, and, to my mind, less reasonable than to place them in the category of tuberculosis.

Discussion.

Dr. De Blois: I think the time has gone by when tuberculosis and lupus were regarded as different and distinct affections. Lupus is nothing but a slow form of tuberculosis. I have always believed them to be identical. The occurrence of tuberculosis in the nose, and in that organ alone, I have never met with; this is the first case I have heard of. A tuberculous process extending from the mouth to the nose is comparatively common. I have seen two or three cases myself in which the tubercular ulceration probably extended from the hard palate up into the nasal cavities. They were all of the proliferative species, and were on the septum rather than on the turbinated bones. I regret to state that I can not report the good results of treatment which Dr. Farlow has obtained. I have always seen temporary amelioration, but the last stage would be worse than the first. I have in my mind a case I saw about two months ago in which the ulceration appeared first on the septum; the growth was cauterized and lactic acid applied, but it extended to the alæ of the nose. The patient is not dead yet, but the relief she obtained from the treatment was only temporary.

Dr. Wright: It seems to me that in a case like this, unsupported by the presence of the tubercle bacilli, we should have to hold the diagnosis somewhat in abeyance. In the scrapings from such a growth in the nose it is rare to find the tubercle bacilli, but if you examine a number of sections of tissue from a tuberculous mass you are sure to find the bacilli. There are a great many forms of chronic inflammation which produce giant cells. A number of cases of tuberculosis of the nose have been reported abroad. Nevertheless, without the tubercle bacilli, I think the diagnosis in the cases reported by Dr. Farlow should be held back, especially where the lesion occurred on the turbinated bodies. In most of the cases reported the lesion occurred on the septum.

Dr. Bryan: About two years ago I had an unusual case in which the primary tubercular lesion was in the post-nasal space. There was a profuse secretion of mucus, especially from the right side of the nose. The

ulcerations increased in size, and extended down along the posterior palatine fold. During the course of the disease a swelling presented itself on the left side of the cartilaginous septum. The scrapings from the posterior nasal space, and also those from this swelling, gave a large number of tubercle bacilli. This patient has entirely recovered under local applications of strong solutions of lactic acid and the use of the curette.

Dr. Casselberry: It would seem to me difficult to distinguish primary nasal tuberculosis from primary lupus of the nasal mucosa; and lupus involving the interior of the nose is not uncommon. Ætiologically the two conditions are seemingly identical, yet clinically lupus assumes a different course, which would suggest at least a modification of the typical tuberculous process. An interesting case of mixed infection came under my observation a few years ago. The patient, a woman, had tubercular infiltration of the upper lobe of the left lung of some years' duration. She acquired syphilis and I treated her for typical primary and secondary symptoms, and for the early tertiary symptoms. About two years after the appearance of the chancre there appeared first within the vestibule of the nose a papular eruption with diffused infiltration, which later extended to the septum and turbinated bodies; while not then actually ulcerated, there was an eroded condition which resisted all attempts at treatment. Gradually the external nasal appendage also began to swell somewhat, and took on a reddish hue. Under the assumption that the condition was syphilitic, the patient was sent to Hot Springs, where vigorous antisyphilitic treatment proved of no avail. The nasal disease became worse. When she returned the lesion had distinctly the appearance of lupus and was so pronounced by several competent dermatologists. Subsequent events have abundantly confirmed this diagnosis.

Dr. Mulhall: In the first case reported by Dr. Farlow no tubercle bacilli were discovered; therefore there is no legal evidence of tuberculosis. Ulcerative lesions of the mucous membranes in my experience, even of a specific nature, are commonly made worse by the use of mercury. Furthermore, it seems somewhat suspicious that this patient was able to take sixty grains of potassium iodide, three times daily, without iodism and not be a syphilitic.

Dr. Farlow: Under the supposition that the lesions might be syphilitic, the patient was put on "mixed treatment" for a time; potassium iodide, in increasing doses, forty or fifty grains, three times daily, and a quarter of a grain of the protiodide of mercury. She took these large doses for a limited time only.

In my paper I said nothing about treatment or prognosis. I simply reported these two cases, which presented sufficient evidence to me to warrant the diagnosis of tuberculosis. In the second case no tubercle bacilli were found. The patient had been under the care of Dr. White for some months, and his decided opinion was that it was not lupus. Dr. Whitney and Dr. Councilman said there was no question about the tubercular nature of the growth, even in the absence of the bacilli.

As regards the use of the curette and lactic acid in these cases, I did not express any opinion as to their value. I hold out no hopes of an absolute cure. Cases of tuberculosis of the nose, however, have certainly been reported in which the patients have lived for thirteen or fourteen years after operation without any return of the lesion. Cases of tuberculosis affecting the septum, in which the bacilli were found, have also been reported. My case was so similar to these, although the bacilli were not found, that I think I am justified in considering it tubercular.

Dr. Rice: Perhaps an interesting clinical fact in connection with this discussion is worthy of mention. When we were all using Koch's tuberculin we had under treatment at the hospital cases of laryngeal tuberculosis pure and simple, and two cases which were stated by Dr. George H. Fox and others to be true lupus of the skin. In one of these the lesion involved the entire integument of the nose and extended into both nasal cavities. In another case, one of tuberculosis of the larynx, there was a spot of ulceration on the side of the nose as large as a penny. All of these patients were given injections of Koch's lymph, and while hardly any benefit was obtained in the case of true laryngeal tuberculosis, the two other cases of lupus were markedly improved by the injections. The extensive ulceration on the integument of the nose in one of these cases of lupus was completely healed by these injections.

It is generally admitted that lupus is a form of tubercular disease, but tuberculosis laryngis and lupus laryngis certainly behaved very differently under the influence of injections of tuberculin.

Dr. F. I. Knight: I should like to narrate the subsequent history of a case which I reported to this association at the first meeting in Philadelphia as a case of lupus beginning in the larynx. Although I am fairly well convinced as to the identity of lupus and tuberculosis, yet the appearances and the clinical history of those cases which we used to diagnosticate with a good deal of certainty as lupus of the larynx or pharynx, as distinguished from tuberculosis, are well marked. One of the cases I reported was that of a girl who had the peculiar thickening and ulceration of the epiglottis which from its history I concluded was lupus—not the tuberculosis of the larynx. Subsequent events showed that the diagnosis was correct. She never had lung disease, but lupus of the nose and face finally developed, so that there was really no question as to the correctness of the diagnosis. That girl was put in the winter of 1891 and 1892 under the most rigorous tuberculin treatment, which resulted in only a very slight amelioration of the skin trouble. She went through a long course of it and finally gave it up and in a few weeks was worse off than before. In that case the tuberculin had no such marked benefit on the lupous lesions as it had in Dr. Rice's cases.

Dr. Swain: I should like to relate a case of interest in relation to the cure of local tubercular lesions. The case came up, as did those of Dr. Rice and Dr. Knight, in connection with the use of tuberculin. The patient, when she was about fourteen years old, had been "given up" to

die of consumption. She suffered from cough and wasting, and had all the symptoms we are so familiar with. In addition to that, she had local trouble in the larynx. I saw the case later, after the whole process had come to a standstill, and found that the tuberculous process had involved the epiglottis, the epiglottic fold, and a portion of the anterior pillar of the soft palate. The case was treated by the family physician with the view that the lesion might be syphilitic and with no result. He then cauterized it with nitrate of silver, I believe, and with a change of climate the patient completely recovered. Seven years later she had lupus of the nose, as diagnosticated by Dr. Fox, which was treated by him by cauterizing each individual nodule with the actual cautery, plunging a red-hot needle into the tuberculous collection, which caused very little disfigurement. This method of treatment was abandoned when Koch's lymph came out, and she was treated by means of that for eight or ten weeks. We got the typical reaction throughout the entire local lesion, and, what was more interesting, also in the line of the old scar around the epiglottis and the arytæno-epiglottic fold. The tuberculin treatment resulted in no permanent good to the lupus. New nodules formed, and the patient is at present again under treatment by Dr. Fox. There is still some comeliness of the nose, although the outer rim and the septum are involved. I offered to treat her by scraping and lactic acid, but she prefers the old treatment.

Dr. Gleitsmann: I wish to say that when the lactic-acid treatment was recommended I was one of the first who made extensive experiments with it in one of my clinics at the German Dispensary, and the results of these experiments were published. About that time I had a patient suffering with primary tuberculosis of the larynx. The patient was treated successfully by means of lactic acid, and was shown at the section meeting of the academy; I also related the case in Berlin three years ago. The lesion was an extensive one—so much so that I was almost disheartened. The treatment consisted in scraping the ulceration and rubbing in the lactic acid. The patient was reported well three years ago, and remained so up to this year. In February last another ulceration appeared at the site of the original lesion. It healed under a similar mode of treatment and the patient has remained well up to the present time.

I wish to add that I have complete faith in the local surgical treatment of the upper air passages in these cases: that is, scraping, the actual cautery, and the application of lactic acid.

Dr. Wright: I have employed this method of treatment in a number of cases, but only in one case have I seen benefit derived from it. For a time I was quite enthusiastic on the subject, but so many failures followed its use that I fell back into my original slough of despair. I recently saw a case of tubercular ulceration of the epiglottis that had been under treatment at the German Dispensary. I scraped the growth and applied lactic acid, with the result that the previously painless ulceration has spread rapidly and become very painful.

Paper.

SOME REMARKS ON THE STRUCTURE OF ŒDEMATOUS NASAL POLYPI.

By JONATHAN WRIGHT, M. D.

THE material upon which the following observations were made was obtained from about one hundred and fifty individuals. A few were normal cases; the others were suffering from various pathological conditions of the upper air passages. About twenty-five of these cases furnished the nasal polypi. All the polypi were removed during life. As nearly all were multiple, the number of separate polypi examined must certainly have been more than fifty but I have no definite record of that point.

This material was prepared for histological examination principally by hardening in alcohol, imbedding in celloidin, and double staining with hæmatoxylon and eosin. Other methods of hardening and staining were also used for comparison.

It is a matter of great regret to me that no material could be obtained by post-mortem section of the nasal cavities. Operations *intra vitam* can never be depended on to furnish the true base of these growths. For this reason alone Zuckerkandl's examinations as described in his last volume * would be of great value.

Epithelium.—From its distribution in the body one can not help drawing the inference that the pavement epithelium is the form chosen by Nature to protect surfaces subjected to friction or irritation of various kinds. Haycraft and Carlier † found ciliated cylindrical epithelium in the trachea of a fœtal kitten. After birth the cilia are lost and the cylindrical epithelium gradually takes on a squamous type according to its exposure to friction.

Normally the epithelial lining of the nasal mucous membrane is cylindrical, ciliated below and smooth above the middle turbinated. Cylindrical epithelium, occasionally ciliated, is the variety that usually covers œdematous polypi. Careful microscopical examinations by several other observers have shown places in these polypi where the cylindrical type is changing or has changed into the squamous. This change was first noted in that part of a nasal polypus

* Zuckerkandl. *Normale und pathologische Anatomie der Nasenhöhle, etc.*, II. Band, 1892.

† Haycraft and Carlier. *Journal of Microscopical Science*, vol. xxx, part 4.

which projected from the nose, and was the most exposed to irritation from the action of the air and the friction from without. Subsequently the same alteration has been noted deep in the nose and supposed to be due to the chafing of the polyp at that point against contiguous parts. While this change has been described and figured by several competent and trustworthy observers, it has never been my fortune to see it in typical gelatinous polypi.

I have, however, repeatedly observed it in those growths where œdema was not a prominent feature. I have seen it so pronounced in a sarcoma of the middle turbinated that from the fragments removed at one time I thought the growth was an epithelioma.

The sections from which the drawings in Fig. 1 have been taken are not from a typical œdematous polypus. It is an advanced con-

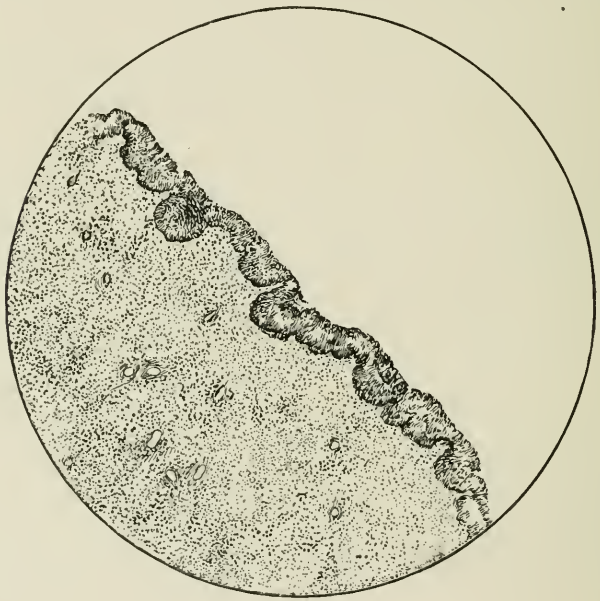


Fig. 1 (*a*).

dition of chronic inflammation of the mucous membrane of the middle turbinated bone in which there are a few areas of œdema. The patient was suffering from empyema of the antrum of long standing. The source of the irritation was evidently not friction of one surface on the other, but the action of the ichorous purulent discharge from the antrum and its formation into crusts. The change

to the squamous type in atrophic rhinitis may be regarded as an analogous process.

Where this change in type takes place in the epithelium you will always notice the increase in the thickness of the layers. Often this thickening or proliferation takes a somewhat symmetrical form, making a scalloped fringe, as seen in the low-power drawing (*a*). Examined with the high power (*b*), it looks as though this proliferation must have started at the center of each scallop from one or two cells. With one twelfth oil immersion the spinous processes of the pavement cell may be seen (*c*). A moderately careful examination of these sections shows a gradual change, from one end of the specimen to the other, of the columnar to the squamous form of cell. The flat cell, however, rarely if ever in this metamorphosis in the nose reaches the dimensions seen in the skin. Although the proliferation of cylindrical cells into the form of digitations and papillæ has been mentioned, I have never seen it. When this proliferation becomes very marked a change of type is always observed in my experience. There are nearly always found places on the surface of these polypi where the epithelial layer is thicker than others and thicker than normal; but where it takes this scalloped form the cells are atypical.

Stroma.—This may best be studied by comparing sections prepared in several different ways, as one method brings out some features at the expense of others.*

Coagulation of the fibrin in the serum which infiltrates the stroma renders differentiation of the connective tissue from it necessary for its study.

When this is accomplished, by means of staining or otherwise, it will be seen that we have as a framework for the mass a network of areolar tissue the size of whose meshes is determined by the amount of serous infiltration. Where the latter is slight we have a firm, where abundant a soft, yielding mass; upon this also depends its degree of translucency. These meshes, usually long spindle-shaped, are filled with fibrin coagulated into granular material, and

* I have prepared sections as follows:

1. Hardening in alcohol; imbedding in celloidin; unstained and stained with hæmatoxylon and eosin.
2. Preliminary hardening in Müller's fluid, stained and unstained.
3. Weigert's fibrin stain.
4. Mounting unstained sections in glycerin with a little acetic acid.
5. Washing out the celloidin with ether and treated as above.
6. Washing out the mucin with baryta water.

threads, cobweb in their fineness under a high power. Sometimes the individual fibers of the fibrous tissue are separated one from another, and with the Weigert stain may be seen, in faintly yellow wavy outlines, the interstices filled with violet fibrin. Usually, how-

Fig. 1 (*b*).

ever, the fibrous tissue is split up into strands of many fibers. There is no homogeneous groundwork taking a deep blue stain with hæmatoxylin, and dotted with branching eosin-stained cells, as in typical myxomata.

Œdema.—As a matter of fact, we have all degrees of this serous infiltration, so slight as to be only recognizable under the microscope in small areas up to the gelatinous state, where, if the fluid is squeezed out of the growth, very little is left.

The posterior ends of the inferior turbinated bodies and the swellings of the mucous membrane on each side of the posterior border of the septum often have in the rhinoscopic mirror a "water-logged look," and when removed with the cold snare would seem translucent if they were not so gorged with blood. Histologically they show no difference from the typical œdematous polypus except as to the *degree* of serous infiltration. The microscope reveals in one

case a condition that is recognizable to the naked eye in the other. Why the typical œdematous polypus occurs more frequently in the upper part of the external wall of the nasal cavity is still a matter of conjecture, not of demonstration.

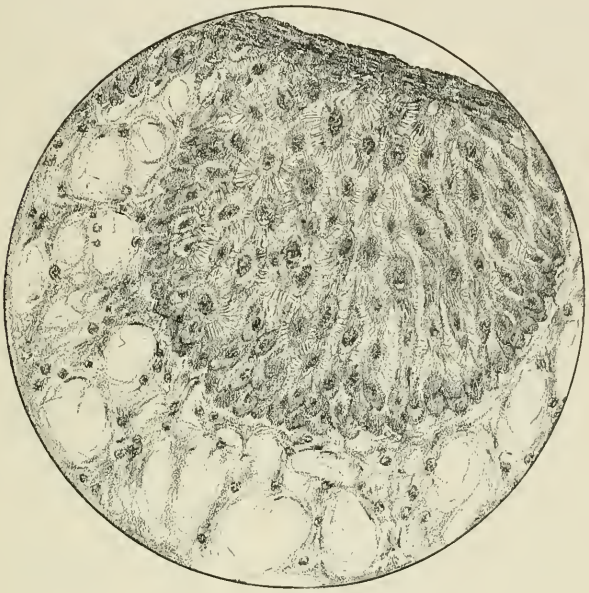


Fig. 1 (*c*).

The œdema is always more marked at the most dependent parts of the growth, whether pedunculated or broad based, but I have never seen it penetrate the epithelial layer, although this has been described, and it has been said that rupture of the epithelial layer has taken place spontaneously so that the serum drained away. It may be doubted if the watery discharges from the nostrils, that are so frequently a distressing symptom in these cases, come as a rule directly from the water-logged tissues. It is probably always due to the irritation of the growth on the surrounding mucous membrane. Osmosis on wet days is evidently, as the law of physics would teach us, from without inward. The serum, containing not only salts in solution but large quantities of mucin, probably does not exude at all or but slightly. Even under the pressure exerted by the snare the external envelope of these growths usually remains intact except in the case of cysts near the surface.

That the elasticity of the tissues exerts considerable pressure on the fluid which they contain may easily be demonstrated by incising a large polyp after it has been removed, laying it on a clean white plate, and noticing the shrinking that takes place in its size, some of the fluid being rapidly squeezed out. This is particularly striking in the œdematous posterior ends of the inferior turbinated bodies referred to above. The more "gelatinous" the growth, the less resiliency it seems to have. The origin of the fluid is, of course, from the blood-vessels, but what the mechanism of its production may be is a matter of speculation and a problem to be left to the general pathologist. It is not a passive œdema. I have never heard of œdema of the mucous membrane of the nose in general anasarca, though it occurs about the soft palate and glottis. Clini cal observation and histological study suggest that it is caused in some way by an antecedent chronic inflammation of the nasal mucous membrane. It may be supposed, first, that this has caused some diminution in the resiliency of the tissues which normally offer an elastic support to the blood-vessels; second, that occlusion of the blood-vessels occurs at some points, since thickening of their walls may be demonstrated in many sections, or they may be occluded by pressure of surrounding distorted tissues. Paralysis of the vasomotor nerves is a matter of pure speculation.

The *fluid* contains serum albumin, which can be demonstrated in the undiluted state by the usual tests, though apparently it is not nearly so abundant as in pleural or abdominal effusions. It contains large quantities of mucin, which may be extracted from the tissues by cutting the polyp in small pieces and allowing them to soak for several hours in baryta water. Heat produces no perceptible change in the resultant fluid. Acetic acid, however, throws down an abundant thick precipitate. Alcohol also produces a slight precipitate. This richness in mucin has been adduced as a proof that these tumors are true myxomata. Mucin is the abundant constituent of the secretions of the normal as well as the abnormal mucous membranes. Mucin has also been demonstrated in inflammation of the connective tissue. It is the product of many varieties of cells. Occurring in the fluid of a nasal polypus neither proves nor disproves its myxomatous nature.

Round Cells.—The exudation of small round cells from the blood-vessels and the production of young connective tissue around them may be seen in Fig. 2.

These areas, as you will observe, bear some resemblance to small

round-celled sarcomatous tissue. This is the only histological suggestion I have ever seen of the reported malignant transformations of these growths. While such so called transformation may occur, just as sarcoma may appear in previously normal tissue, it is probable that the idea of its frequency arises from mistaking the character of the growth in its origin. Again, we meet in nasal pathological histology the difficulty, to which I have on several occasions drawn attention, of differentiating between granulation tissue, lymphoid hypertrophy, and small round-celled sarcoma. In this section the origin of the area is evident, but when in the section of

Fig. 2.

these areas the lumen of the blood-vessel does not happen to be included, the resemblance to sarcoma is marked. In the same drawing you will notice at some distance from the blood-vessels round lymph cells of considerably large diameter, few in number, more widely separated one from another, and entangled in the fibers of the areolar tissue, the spaces of which are dilated and filled with granular fibrin. The ordinary hardening in alcohol and double staining does not reveal the branching cells of the connective tissue. Unstained and mounted in glycerin with a little acetic acid,

the sections show them. A few cells may be seen in the connective tissue treated in this manner which resemble endothelial cells, but it is difficult to say whether these are derived, as some maintain, from the walls of the lymphatics, or are really altered connective-tissue cells. Any further evidence that the areolar spaces are really dilated lymph channels I have not been able to observe.

The exudation of small round cells into the stroma is frequently very marked. With the ordinary double staining the presence of one of these round cells in a dilated areolar space frequently gives the appearance of a large flat epithelial cell, the small cell serving as a nucleus and the walls of the areolar space serving as the edge of the cell. A very little study, however, easily shows its true nature.

Glands.—Billroth * first described nasal polypi more than thirty-five years ago as being made up principally of glandular tissue. In his *Surgical Pathology* in 1882 he says: "The majority of the mucous polypi of the nose . . . consists mostly of distorted and also of newly formed mucous glands whose closed ends are dilated occasionally to mucous cysts." This statement has been repeated by a few and contradicted by many. In my experience œdematous nasal polypi always contain fewer glands by far than the normal tissue. I presume true adenoma does occur in the nose. I have never seen one and I have never read a description of one which did not correspond fairly well with ordinary hypertrophy in which the glands had not for some reason undergone the degeneration usually seen in them from such chronic inflammatory changes. There is great discrepancy in the statements as regards the frequency of gland tissue in nasal polypi. It seems to me that this difference of opinion has arisen from the fact that the majority of observers have examined only those polypi removed during life with the snare, while others have examined those taken post mortem from heads laid open by a longitudinal section. Now, the serous infiltration being always most abundant at the most dependent part, the more marked it is, the less there is seen in the section of the normal parts of the mucous membrane—*i. e.*, the glands, blood-vessels, etc. The budding or protrusion of what is to be a pedunculated polyp begins at some weak or more diseased spot of the mucous membrane, and, pushing out, carries down with it only a small part of the normal subepithelial structure. Consequently the glands relative to the extent

* I have not been able to obtain a copy of Billroth's *original* paper—Ueber den Bau der Schleimpolypen, Berlin, 1855—but my information in regard to it is derived from quotations, frequently unreliable.

of the swollen œdematous tissue are scanty, sometimes not seen at all in very many sections. Where the connective-tissue fibers are abundant and the spaces between their bundles small—*i. e.*, where the serous infiltration is slight—glands are seen to be relatively more abundant. The same is true of the blood-vessels and for the same reasons. Operations with the snare or other instruments are frequently more or less incomplete, the pedicle being rarely severed at the base. The apparent pedicle is really nothing in many cases but the tissues squeezed together by the tightening snare. The place of

Fig. 3.

origin of the growths makes a great difference. Around the hiatus semilunaris the glands are not normally so abundant as along the free border of the middle turbinated or on the septum, consequently the polypi that spring from this region do not contain so many of them. When these glands are found they are always extensively affected by morbid changes. The glandular epithelium is swollen and granular; the outlines of the cells are frequently lost and sometimes all the cells in the section of the gland are separated from the walls; occasionally nothing is seen of the epithelium at all, only the round fibrous ring being left. Occasionally in chronic rhinitis and in

hypertrophy of the nasal mucous membrane, where œdematous areas have begun to appear, one may observe an encroachment upon a disorganized gland by the proliferation of the fibrous tissue of stroma around it. Sometimes fibrous nodules are seen which are apparently the ultimate results of this fibrous proliferation. This is an analogous change to that occurring in the blood-vessels in syphilitic inflammations. It is not very common, but a moderate number of sections of the hypertrophied mucous membrane will always furnish a few examples. I have never observed it in the œdematous areas themselves.

Blood-vessels are scanty and small. Their walls in some cases are much thickened in their fibrous layer. They are frequently seen in section just beneath the epithelium, as shown in Fig. 3, corresponding to the delicate red tracery seen in the freshly removed polyp. In the stroma they are frequently surrounded by the zone of round-cell infiltration and new connective tissue spoken of above and shown in Fig. 2.

Cyst formation is occasionally a striking feature. Fig. 4 represents the photograph of a section of a sessile œdematous growth *—the so-called polypoid degeneration—under a low power.

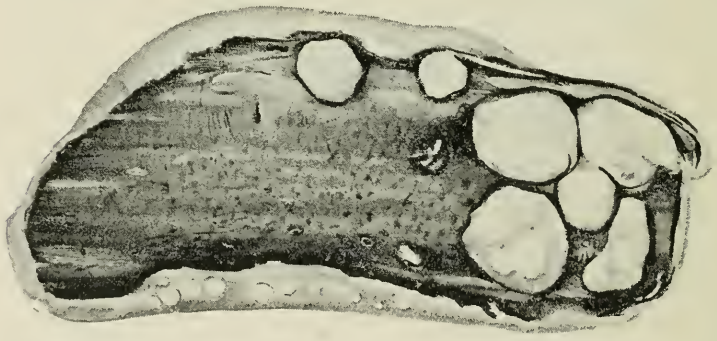


Fig. 4.

You will see that the parenchyma is riddled with these glandular cysts. Microscopically a large number of glands may be seen in various stages of degeneration. Almost always before these cysts reach microscopic proportions the glandular epithelium is completely destroyed. This change is probably due to the plugging of the glandular conduits, and to the loss of elastic support normally

* Specimen kindly sent me by Dr. Knight.

furnished by the stroma, but lost in the process of inflammation and serous infiltration. Occasionally a cyst is formed by a dilated blood-vessel. Such a one you see in Fig. 5—another low-power photograph. In this case smaller dilatations of neighboring blood-vessels occur. It is a cavernous angeiomatous hypertrophy of the posterior end of the inferior turbinated body. Examinations of other sections of this growth show small areas of œdematous infiltration ; but, of course, this vascular dilatation is never observed, or only to a very slight degree, in typical gelatinous polypi. Another method of cyst formation has been described—*i. e.*, the breaking down of the dilated areolar spaces into one or more large cavities. This is possible, but I have never seen it. There are many places, indeed, where the stroma has given way and these spaces communicate with one another in the sections, but I have always thought that this was principally the result of the hardening and cutting

Fig. 5.

process. The effusion of blood into the tissues and the breaking down of the clot into a cyst I have never seen. The effusions of blood which one occasionally sees in the tissues seem to be the result of violence in removal, though it has been described as occurring spontaneously. There is no reason why one of these glandular cysts should not go on growing in a polyp until it occupies the whole of it. This is doubtless the origin of the pure nasal cysts that have been described.

Hyaline bodies resembling those of rhinoscleroma, described as very common by Stepanow,* I have never observed, though I have not adopted any special method of staining to demonstrate them.

Fat cells, or cells containing oil globules, as seen in myxomata, I have never observed.

Nerve fibers I have not looked for. They are said not to exist.

* Stepanow. *Monatssch. f. Ohrenheilk.*, 1891, No. 5, R. 134.

Bone spicula I have never seen in these growths, as described by Zarniko.* In bone disease of the ethmoid accompanying polypi, pieces of bone are frequently included in the mass removed.

On the relation of ethmoid bone disease to nasal polypi Woakes has laid great emphasis. From the fact that ethmoid bone disease frequently exists without polypi and polypi usually exist without bone disease, we are warranted in concluding that neither is essential to the other, but both are the results of some antecedent pathological condition.

I do not mean to deny that *myxoma* may occur in the nose, but I do not believe that is the *usual* character of the growth we know clinically as a gelatinous nasal polypus. Were it so, the frequency of myxoma formation there would far exceed its presence in all other situations.

From the study of the pathological histology of œdematous polypi which I have detailed to you, from much similar work which is merely collateral to the subject matter of this paper, and, lastly, from clinical observation, it seems to me very evident that we have here to do not with a myxomatous tissue, but with one of the results of chronic inflammation of the mucous membrane, which in its early stages is usually hypertrophic. Hypertrophic rhinitis may result (1) in atrophy, with or without ozæna; (2) in œdematous nasal polypi, broad-based or pedunculated; (3) in bone disease, especially of the anterior end of the middle turbinated. This bone disease is usually at first hypertrophic or hyperplastic. This may result in rarefaction, forming bony cysts, or in caries, wrongly called necrosis by Woakes. This caries is frequently the cause of extensive suppuration of the ethmoid cells. All these three pathological states may exist separately or in combination, having had a common origin.

Œdematous polypi are frequently associated with empyema of the antrum. The antrum suppuration may be secondary to ethmoid suppuration, or due to the occlusion of the hiatus semilunaris by the polypi. In the vast majority of cases, however, suppuration of the antrum is of dental origin. I mean those cases with recognizable symptoms. The so-called "latent empyema," it seems to me, is found more often in recent literature than in practice.

Œdematous nasal polypi are spoken of as recurring after operation. I doubt if they ever recur growing from the stump left after removal. It is almost always from adjacent membrane; scar tissue does not readily become œdematous.

* Zarniko. Virchow's *Archiv*, No. 128, p. 132, 1892.

If you will carefully observe in cases of recurrence where you can see the base of implantation, I think you will notice that the new growth does not occupy exactly the same position as the old. Cauterization of the base of these growths, therefore, is not of so much importance as the cauterization of the adjacent mucous membrane. I want, however, to protest here against the statements of the ease with which the base of these growths is reached.

You are all familiar with Zuckerkandl's declaration in his first volume of the inaccessibility of the region from which these growths most frequently spring. In a bloody nose, usually narrow, it is a physical and technical impossibility to see or reach the base of implantation in the majority of cases. Removal of the anterior end of the middle turbinated is only a possible feat in a very few cases. Those growths springing from the free border of the middle turbinated (and they are usually sessile) have, of course, accessible bases. Cauterization here is frequently followed by atrophy of the mucous membrane over a larger area than that actually burned.

Nothing, of course, need be said before this association of the practice (if it really exists) of using a cautery beyond the reach of one's vision in the upper region of the nose.

Discussion.

Dr. Mulhall: I wish to take exception to one statement made by Dr. Wright—namely, that atrophy is the result, commonly, of a preceding hypertrophy. I wish to take exception also to the generally received opinion that atrophic rhinitis is subsequent to hypertrophic rhinitis. I believe I was the first to point out, some eight or nine years ago, that atrophic rhinitis, in ninety per cent. of cases, was a disease of childhood, and was often the result of an acute inflammatory process, scarlet fever, measles, etc., resulting in acute atrophy. In Burnett's work on Diseases of the Nose and Ear he has the word cirrhotic in parentheses after the word atrophic, as though the two terms were convertible. Long-continued hypertrophy may result in cirrhosis, but not in atrophy. This rule holds good in the nose, as it does in other organs in the body. Cirrhosis of the liver is the result of a long-continued hypertrophy. Atrophic rhinitis is a disease almost *ab initio*, and is not the result of hypertrophic rhinitis.

Dr. Porcher: I have two instruments which I wish to present to the association. The first is a recent modification of a self-retaining palate retractor, the description of which appeared in the *Medical Record* in April, 1888, and previous to that of any similar device. In its present form, being made of aluminum and the slide being without screws and catches, the action is entirely automatic and not at all clumsy. The

hook is a solid band and is bent backward and divided at the end so that it does not bruise the septum while the palate is securely retracted. The slide is held in position by the pressure of the retracted palate. The second instrument is a modification of the Sajous cold-wire snare. The modification consists only of the removal of the grooved duck-bill end, so that a simple tongue and cannula remain. This tongue, being armed with a wire loop one to two inches in diameter and the ends bent forward and drawn backward into the cannula, which effectually prevents them from slipping, the operator is enabled to use the instrument repeatedly without changing the wire. These two instruments are especially effective for the removal of all naso-pharyngeal growths, adenoids, etc. With the aid of the rhinoscopic mirror and tongue depressor the wire can be made to encircle and remove a growth in any situation with comparative ease. Messrs. Meyrowitz & Co., of this city, have made the present models.

Dr. Casselberry: Concerning the microscopic examinations of nasal polyps, I think that Dr. Wright has confirmed to a large extent those facts which we have already accepted; but one feels a sense of satisfaction in having such a confirmation from a man of known reputation in this line of work.

Concerning the clinical aspects of his paper, he touched upon one point about which I have had occasion to write, and that is, the removal of the anterior end of the middle turbinated bone as a means of access to the point at which these growths most frequently take origin—namely, the hiatus semilunaris or the edge of it. I do not mean to say that all myxomata take origin here, but I have had occasion to confirm the observations of Zuckerkandl, who asserts that at least two thirds of these growths are located in the region stated, and are therefore inaccessible, practically, so long as the turbinated body remains in its usual position. I do not intend to assert that it is possible in all cases to remove the anterior end of the turbinated body in order to gain access to this region, or that it is best to do so even in the majority of cases; but I have reported some cases in which this was possible and in which no deleterious results came from it. Some of these cases were not absolutely cured, but I was able to keep the growth under control, having gained access to this particular locality.

I understand that this discussion also includes Dr. Johnston's paper, relating to a case of nasal polypus projecting into the naso-pharynx. I was very much interested in the specimens he exhibited. I have in several instances had considerable trouble in passing the wire around myxomata which grew backward in this direction. I can not recall any case in which the growth reached the size of the one shown by Dr. Johnston. In some cases I have been able to pass a cannula such as Dr. Porcher exhibited behind the velum, so as to catch the polypus from the rear; at other times I have been able to reach it with the aid of cocaine contraction after the patient had violently blown his nose, so that the growth pro-

truded forward, thus enabling me to catch it from in front. The removal of these growths demands the greatest skill.

Dr. Wright: In reply to Dr. Mulhall's statement that atrophy is not consequent to hypertrophy, I can only say that it opens a large field for discussion. My opinion regarding this matter, which may be changed by future observation, was gained from a careful microscopical examination of numerous microscopic sections of nasal growths; these investigations led me to the conclusion that in the large majority of cases atrophy is preceded by hypertrophy. The sections were not only examined in cases of polypi, but in conditions bordering upon that. There are many grades of hypertrophy. That the terms cirrhotic and atrophic are not interchangeable is, of course, admitted. In the atrophy which takes place in the fibrous structures the fibrous tissue is the last thing to disappear. But finally that atrophies also, and if you examine a number of cases, in some you will find the mucous membrane so thin that you can feel the bone directly underneath the mucous layer.

As regards Dr. Casselberry's suggestion to remove the anterior end of the middle turbinated bone, in order to gain access to these growths, I would say that in most cases I am unable to do it. In many cases the outline of the bone gradually slopes from before backward and downward, and I know of no instrument which will enable us to remove it; no snare will grasp it. I have often found this difficulty almost insurmountable. I myself have been very unfortunate in my attempts to remove the anterior end of the middle turbinated, but perhaps Dr. Casselberry has run across a more favorable set of cases, or perhaps he has unconsciously exaggerated the number of cases in which it is possible to follow out his suggestion. Or possibly my own experience has been the exceptional one.

The size of the polypus removed by Dr. Johnston is very remarkable. I removed one a few weeks ago that existed twenty-four years, curled up in the nose. Before it was put into alcohol it measured five inches in length.

Paper.

THE TREATMENT OF DEVIATIONS OF THE NASAL SEPTUM.

By JOHN O. ROE, M. D.

THE predisposing and exciting cause of many chronic diseases of the air-passages is nasal obstruction, which results perhaps as often from deviations and excrescences of the nasal septum as from any other conditions. The frequency with which deviations occur is very great; in fact, they are so often found that Stoker*

* *Deviations of the Nasal Septum*, London, 1888, p. 1.

says he doubts if such a thing as a perfectly straight septum exists. The following statistics give some idea of the frequency of deviations of the septum:

Zuckerkandl* found deviations in 37·8 per cent.—140 in 370 cases observed by him; Delavan,† in fifty per cent.; M. Mackenzie,‡ in 76·9 per cent.—1,657 in 2,152 cases; Jarvis,# in eighty-one per cent.—81 in 100 cases; Sendziak,‖ in 83·5 per cent.—167 in 200 cases; Simanowsky, △ in ninety-five per cent.—925 in 974 cases; P. Heymann, ◊ in 96·4 per cent.—241 in 250 cases; Von Klein, ‡ in ninety-eight per cent.

Nearly all statistics collected upon this subject are defective since they fail to specify the location of the deflection. It is a fact, however, that two thirds of all cases of deviation are confined to the cartilaginous and to the anterior portion of the osseous part of the septum. This is illustrated in the statistics just cited. Zuckerkandl's observations were made from dry skulls in which he found but 37·8 per cent. of deviations, indicating that in these cases the deviation was confined to the osseous portion, whereas in observations made entirely upon the living subject, in which the cartilaginous portion is present, the percentages reach from fifty to ninety-eight.

Classification.—Various attempts at classification have been made in regard to the form of the deviations, and nearly every writer on this subject has a classification of his own. Thus Loewenberg ↕ divides them, according to their situation and direction, into superior, inferior, horizontal, and vertical deviations; Jarvis, ⇟ into osseous, cartilaginous, and osseo-cartilaginous; Sendziak,** into simple deviations to the right or left, and deviations with partial thickening; Stoker †† considers the subject under the following heads:

* *Anatomie der Nasenhöhle*, erstes Bd., S. 102, zweite Auflage, 1893.

† *Transactions of the American Laryngological Association*, 1887. New York, 1888, vol. ix, p. 202.

‡ *Diseases of the Throat and Nose*, vol. ii, p. 433.

New York Medical Journal, 1888, vol. xlviii, p. 13.

‖ *Journal of Laryngology and Rhinology*, 1891, vol. v, p. 85.

△ *Vratch*, vol. xi, 1890, No. 37.

◊ *Berliner klin. Woch.*, 1886, Bd. xxiii, S. 329.

‡ *Times and Register*, 1889, vol. xx, p. 699.

↕ *Zeitschrift für Ohrenheilkunde*, Wiesbaden, 1883, Bd. xiii, S. 1.

⇟ *Loc. cit.*

** *Journal of Laryngology and Rhinology*, vol. v, 1891, p. 89.

†† *Deviations of the Nasal Septum*, p. 9.

Angular, curved, sigmoid, dislocations (so called), spurs, adhesions, exostoses; Rosenthal* has divided deviations of the septum into six different classes:

1. Simple deflection without thickenings.
2. Deviations with thickenings or spurs.
3. Sigmoid deviations in vertical or anterio-posterior direction.
4. Sigmoid deviations of both kinds with spurs.
5. Cristæ, without deflection of the nasal sæptum.
6. Zigzag deviations.

The division of deviations into osseous, cartilaginous, and osseocartilaginous, as suggested by Jarvis, is by far the most natural method, and all attempts at further classification are necessarily futile, since the septum varies as much in its size, shape, and position as does the external contour of the nose or the face, and in no two cases are there found the same amount and kind of deviation. Sedziak's second division, consisting of deviations with partial thickenings, in the shape of spurs (spinæ, cristæ), is misleading. This is a condition of apparent deviation, but not a real one, for it is often the case that one nostril will be occluded by an osseous outgrowth or spur, whereas the septum on the opposite side may be straight. This condition is not treated as a deviation of the septum, and can not therefore be classed as such.

Treatment.—Before detailing the methods that I have found most efficient in the correction of deflections and deformities of the nasal septum, it may not prove uninteresting to review briefly and systematically the methods that have been from time to time proposed by others and found by them to be of the most service.

The treatment of deviations of the septum may be divided into palliative and radical.

Palliative treatment consists in the adoption of such measures as may remove the exciting cause—such as the removal of turbinated hypertrophy, or of an osseous growth of the turbinated body, or the removal of enlarged tonsils, adenoid growths, and such other conditions as may obstruct the nostril and interfere with proper development of the nose.

Radical treatment consists in the employment of measures by which the deviation is forcibly and more or less speedily corrected, and may be divided into (1) non-surgical and (2) surgical.

(1) *Non-surgical Treatment.*—Non-surgical methods are those by

* *Sur les déformations de la cloison du nez et leurs traitements chirurgicaux.* Thèse de Paris, 1888.

which the septum is forced to the proper position without the employment of cutting or lacerating instruments. They are efficacious mainly where the deflection is confined to the anterior or cartilaginous portion of the septum, and consist in the employment of pressure upon the convex side sufficient to force the septum back into the median line. This may be accomplished in two ways: by slowly forcing the septum back into place; or by forcing it into place at once and holding it there by means of a retentive apparatus. The former method was the one first proposed for the correction of deviation of the septum. This was brought forward by Quelmalz * a century and a half ago, and it was he who was the first to call attention to the importance of correcting deviated septa. His plan was to force it back into place by daily digital pressure, until the septum retained its normal position. Since his time this method has also been advocated by many others. Michel,† in 1876, recommended pressure in a similar manner upon the convex side of the deviated septum from fifty to a hundred times a day. In 1888 Boyer‡ proposed the application of a bandage to the external portion of the nose sufficiently tight to modify the deformity. Massei,# Boucher, ‖ and Masucci ^ have proposed the employment of compressed air from the apparatus of Waldenburg for about five minutes several times a day. Dionizio ◊ suggests the introduction during the night of a gauze or cotton tampon into the nose, to exert a more or less continuous pressure after the employment of compressed air. The attempt to force the septum into the median line by the use of prepared sponges, metallic sounds, and the like, has been abandoned on account of the irritation they excite and the comparatively small amount of good accomplished.

Rapid dilatation of the occluded nostril and restoration of the septum may be accomplished by the use of dilating instruments, such as the nasal dilator figured and described by Woakes‡ in 1883. The instrument proposed by Woakes' is, however, of very slight power in comparison with the dilator proposed by Hewetson‡

* *De Narium carumque sæpti incurvatione*, Lipsiæ, 1750.

† *Die Krankheiten der Nase*, Berlin, 1876.

‡ Rosenthal. *Les déformations de la cloison du nez*, etc., Paris, 1888.

Patologia e terap. della faringe, etc., Vallardi, Milano.

‖ *Arch. ital. di laringologia*, 1888, viii, No. 1, p. 19.

^ *Giorn. internaz. delle scienze mediche*, 1881, n. s., p. 160.

◊ *Revue internationale de rhinologie*, etc., 1893, tome iii, p. 82.

‡ *British Medical Journal*, 1890, vol. ii, pp. 620, 621.

‡ *Ibid.*

three or four years ago. Hewetson's instrument very much resembles a large steel glove stretcher, and was primarily devised for the treatment of nasal stenosis. This method has also been employed with success by Hill,* Scanes-Spicer,† Lennox Browne,‡ and Orwin.#

(2) *Surgical Treatment.*—The correction of deviation and deformities of the septum by surgical means may be accomplished by a variety of methods. They may be enumerated as follows:

1. By the use of forceps having flat parallel blades.

2. By removal of the prominent portion of the deflection with (*a*) knife, (*b*) chisel, (*c*) saw, (*d*) scissors, (*e*) files, burrs, drills, and gouges, (*f*) needle and snare, or (*g*) punches.

3. By the destruction of the prominent portion with caustics, electrolysis, or galvanic cautery.

4. By incising the septum with knife or cutting forceps.

5. By the employment of pins.

6. By fracturing the septum by means of comminuting forceps.

1. *Forceps with Flat Blades.*—The method of correcting the deformity by means of forceps was first proposed by Adams,‖ of London. His well-known forceps is constructed with strong, flat blades, a blade being inserted in each nostril and sufficient pressure exerted to force the septum into place. The septum is then retained in its proper position by ivory plugs or steel plates, held by screws, until the cure is complete. Too great pressure must be carefully avoided, while frequent cleansing is also needed. After a time the ivory plugs may be replaced by plugs made of wadding or oakum. Jurasz△ modified this method by employing forceps with detachable handles, so that the blades of the forceps could be left *in situ* after making the correction, and held firmly in place by means of screws. This method of procedure has been still further modified by Delstanche,◊ who has the blades of the forceps covered with rubber. Hope,‡ of New York, has devised a forceps to be used in

* *British Medical Journal*, 1890, vol. ii, pp. 620, 621.

† *Ibid.*

‡ *The Throat and Nose and their Diseases*, 3d ed., London, 1890, p. 590.

British Medical Journal, 1890, vol. ii, p. 621.

‖ *British Medical Journal*, 1875, vol. ii, p. 421.

△ *Berliner klinische Wochenschrift*, Bd. xix, 1882, S. 49.

◊ *Annales des maladies de l'oreille*, etc., tome xi, 1885, p. 269.

‡ *Medical Record*, 1889, vol. xxxv, p. 111.

connection with the Adams forceps in the operation for the refracture of the septum. By the action of one blade carrying a steel pin, which is received into a corresponding circular opening in the opposite blade, the septum is pierced with a line of punctures drawn at a sufficient interdistance to map out a direction of fracture in exact conformity with the intention of the operator; and, in completing the separation of the bony continuity with the Adams forceps, any extreme force ordinarily necessary is obviated. Garrigou Desarènes * has described an instrument devised by him for correction of deviated septa. The forceps is composed of two blades, with corresponding convexity and concavity, which are placed in each nostril; these two blades are tightened by a screw before the fracturing of the cartilage.

2. *Knife, Chisel, Saw, etc.*—Excision of the prominent portion of the deflected cartilage with a *knife*, so as to render the occluded nostril free, was first practiced by Dieffenbach † in 1845. This method is still employed by Geuzmer ‡ and many others. Heylen # modified this method by first dissecting the mucous membrane carefully from the surface of the deformity, and then removing the prominent portion of the cartilage with scissors. Demarquay ‖ describes a still more complicated operation by which he opens the nasal cavity by an incision along the ridge of the nose, in the median line, in order to gain free access to the parts. The mucous membrane is then dissected from the prominences, which are removed with a knife. The membrane is then united over the part by sutures, the external wound being closed in the same manner. In anterior cartilaginous deviations Ingals,△ of Chicago, has modified the methods of Dieffenbach and Heylen as follows: He makes first an oblique incision through the membrane of the convex portion of the prominence. The membrane is then detached a certain distance on each side of the cut from the underlying cartilage, thus exposing the latter. A V-shaped piece is then excised from the deflected cartilage, and the parts are brought together by sutures the cartilage being pressed into line and supported by means of tampons. Similar means for the correction of the deformity have been

* *Journal de médecine de Paris*, 3 février, 1889.

† *Die operative Chirurgie*, Bd. i, Leipsic, 1845.

‡ *Revue de chirurgie*, No. 12, 1887.

Ann. de la Soc. de méd. d'Anvers, tome iv, 1847, p. 21.

‖ *Gazette des hôpitaux*, 1859, p. 470.

△ *Transactions of the American Laryngological Association*, 1882, vol. iv, p. 61.

adopted by Petersen,* Moldenhauer,† Krieg,‡ and also by Post of New York, as quoted by Robinson.#

Hartmann,‖ in 1884, was the first to make use of the *chisel* for the excision of the prominent portion of the septum. Heymann△ likewise employs an ordinary carpenter's chisel in removing the projecting portion, a method that has been adopted by Seiler.◊ The chisels employed by Seiler are, however, very delicately constructed, being operated either by the hand or a small mallet.

The *saw* is especially adapted for the removal of osseous or cartilaginous spurs, usually found along the convex angle of the deflection, or occurring as inflammatory deposits along the line of junction of the different portions of the septum, or of the septum with the superior maxilla. Such deposits are often found when the septum is scarcely or not at all bent. The most ardent advocate of the saw is Bosworth.‡ After giving Woakes and Seiler credit for previous use of the instrument in correcting nasal deformities, Bosworth thus describes the form of saw employed by him: "The blade is as thin as possible, consistent with strength, an eighth of an inch wide, five inches long, with a cutting edge of three inches, with thirty teeth to the inch, each tooth an exact equilateral triangle, with no cross-cut and no set to the teeth, the handle being three inches long, of sufficient size to be grasped by the hand, and attached to the blade at an angle of forty-five degrees, in order that the hand should in no way obstruct the view while operating. These saws are constructed in two forms, one with the cutting edge upward and the other with the cutting edge downward." Especially adapted for the removal of spurs and ridges from the septum are the small bow saws that I devised for intranasal work about four years ago and presented to this association in 1889.↕ These saws, by reason of the blade being held firmly by a rigid bow, are superior to the ordinary nasal saw, in that the blade is not readily deflected from the straight line. One of the principal objections to Bosworth's pat-

* *Berliner klinische Wochenschrift*, Bd. xx, 1883, S. 329.

† *Die Krankheiten der Nasenhöhle*, 1886.

‡ *Medicinisches Correspondenzblatt des würtembergischen ärztlichen Landesvereins*, 1886, Bd. lvi, S. 201, 209.

Nasal Catarrh and Allied Affections, 2d ed., New York, 1885, p. 189.

‖ *Bulletin de la Société de chirurgie de Paris*, tome x, 1884, p. 390.

△ *Berliner klinische Wochenschrift*, Bd. xxiii, 1886, S. 329.

◊ *Medical Record*, 1888, vol. xxxiii, p. 182.

‡ *Diseases of the Nose and Throat*, New York, 1889, vol. i, p. 303.

↕ *Transactions of the American Laryngological Association*, 1889, p. 143.

tern is that the slender blade is so flexible that, in holding the blade up against the septum on starting the saw, it is quite apt to be bent out of the straight line, and therefore in sawing describe a curve.

Scissors of different patterns have been devised by different operators for the removal of excrescences from the septum. The writer has for about twelve years used a pair of toothed or grapevine scissors, devised by himself, with the blades set at an obtuse angle to the handles, so that the view of the blades may not be obstructed by the hand. Especially constructed scissors have also been devised by Seiler,* Jarvis,† Sherwell,‡ and Fraenkel.#

Sandmann‖ makes use of *files* to remove osseous growths from the septum.

Burrs, similar to dental burrs, for the removal of excrescences from the sæptum, were, I believe, first employed by Goodwillie,△ and afterward adopted by Seiler.◊ These are operated by a dental engine or an electro-motor. Goodwillie has since devised a shield for the burr, to prevent injury to the soft parts. The nasal plane devised by Jarvis‡ is simply a burr projecting slightly through a flat shield. By passing it over a rough surface, the inequalities are removed or planed off. The *drills* devised by Curtis‡ are of special service in the removal of bony growths and exostoses. The only objection to their use that can be raised is the rough and irregular surface they may leave. In addition to the above-named surgeons, the trephine has as its advocates Bronner,‡ J. Wright,** Astier,†† and Lennox Browne.‡‡ In most instances the use of drills is regarded as but preparatory for the easy admission of the nasal saw.

Wright ## has proposed the plan of employing a nasal trepan for the purpose of making a hole from the anterior to the posterior end

* *Diseases of the Throat*, Philadelphia, 1893, 4th ed., p. 339.
† *Medical Record*, vol. xxvii, 1885, p. 284.
‡ *Ibid.*, vol. xxxi, 1887, p. 450.
\# *Transactions of the International Medical Congress*, Berlin, 1890.
‖ *Deutsche medicinische Wochenschrift*, Bd. xvii, 1891, S. 327.
△ *Medical Record*, vol. xvi, 1879, p. 28.
◊ *Op. cit.*, p. 334.
‡ *Medical Record*, vol. xxxi, 1887, p. 408.
‡ *Medical Journal*, vol. xlv, 1887, p. 596.
‡ *Lancet*, London, 1890, vol. ii, p. 172.
** *Medical Record*, vol. xxxvii, 1890, p. 36.
†† *Annales des maladies de l'oreille*, etc., tome xvii, 1891, p. 643.
‡‡ *The Throat and Nose and their Diseases*, London, 1890, p. 588.
Op. cit.

of the deviation, in such a manner that it goes as close to the mucous membrane on the opposite side as possible without perforating it. Into the resultant tunnel a saw is inserted and the exostosis is removed by sawing upward and downward from the opening made by the drill. This plan has also been adopted by Lennox Browne.*

Gouges of various devices have been employed for the removal of septal projections and irregularities. To trim off portions of redundant cartilage, Weir † employs a gouge forceps, mounted like a dressing forceps, and Jarvis‡ has for the same purpose devised his fenestrated cartilage forceps. For bony growths and ridges Jarvis uses his rongeur forceps. In order to avoid the destruction of the mucous membrane, Greville MacDonald # incises the muco perichondrium over the center of the bony ridge or growth to be removed with a small, especially constructed knife, and raises the periosteum with his spud or "raspatory." He then removes the bone with his flat, curved, or triangular gouges and replaces the flaps.

The method of removing the salient portion of the septum by means of *needle and snare*, proposed by Jarvis ‖ in 1882, may be briefly described as follows: The base of the cartilaginous projection is pierced with a transfixion needle until the point reappears. The wire loop of the écraseur is now passed over the point of the needle projecting into the nostril, and tightened around the transfixed tissue by forcing up the outer cannula with a movement of the finger against a milled nut. A few turns of the milled nut cause the wire to sever the engaged portion.

For the purpose of removing an angular portion of a deflection or a unilateral obstruction to respiration, *punches* of various forms have been devised, such as those by Blandin,△ Rupprecht, ◊ Roser,‡ and Goodwillie. In all respects they resemble that first proposed by Blandin, which consists essentially of a modification of an ordinary shoe punch. Another variety of punch, or stellate blades, has

* *Op. cit.*, pp. 594 *et seq.*

† *Medical Record*, vol. xvii, 1880, p. 279.

‡ *Medical Record*, 1885, vol. xxvii, p. 284.

Diseases of the Nose and its Accessory Cavities, London, 1892, 2d edition, p. 203.

‖ *Transactions of the American Laryngological Association*, vol. iv, 1882, p. 69.

△ *Compendium de chirurgie pratique*, tome iii, p. 33.

◊ *Wiener medizinische Wochenschrift*, Bd. xviii, 1868, S. 1157.

‡ *Berliner klinische Wochenschrift*, 1880, Heft xvii, S. 649.

been devised for the purpose of making incisions in the cartilage sufficient to overcome the resiliency. This idea is simply a modification of the plan adopted by Chassaignac,* who dissected up the mucous membrane and then made a number of incisions through the deflected portion by means of a knife, which rendered the cartilage pliable, so that it could be maintained in a vertical position until it became solidified. The first device adopted for the accomplishment of this object by means of a punch was that used by Bolton.† His instrument was similar to a buttonhole scissors, by which he was enabled to make incisions in different directions by changing the direction of the handles. Steele‡ further modified this form of instrument by adopting a stellate punch, so that the operation is completed at one sitting.

3. *Caustics, Electrolysis, and Galvanic Cautery.*—Bresgen,# in 1887, proposed for the correction of cartilaginous deviations the use of chromic acid, either in crystals or in concentrated solutions. Miot,‖ in 1888, was the first to make use of electrolysis to remedy thickenings or deviations of the septum. Garel,△ Moure,◊ Botey,‡ Tilly,↕ and Rosenthal‡ have confirmed the good results obtained by Miot. Needles of steel or platinum are ordinarily used. Originally Miot connected the needles used with only the negative pole, but Moure and Bergonié** make use of both poles. This latter method has the advantage of being more rapid and less painful than the former. The action of electrolysis is due to the cauterization of the tissues by decomposition of the liquids, since, in proportion to the intensity of the current, acids are formed at the positive pole and alkalies at the negative. The use of the galvanic cautery, so warmly recommended by Voltolini,†† was first proposed by him in 1888. In deviations of the cartilaginous septum, by means of the galvanic cautery he removes enough of the prominent portion to

* *Gazette des hôpitaux*, 1851, p. 420.
† *Richmond Medical Journal*, vol. v, 1868, p. 241.
‡ *St. Louis Courier of Medicine*, vol. i, 1879, p. 485.
# *Wiener medizinische Presse*, Bd. xxviii, 1887, S. 237.
‖ *Internationales Centralblatt für Laryngologie, etc.*, Bd. v, 1888–'89, S. 531.
△ *Transactions of the International Medical Congress*, Berlin, 1890.
◊ *Ibid.*
‡ *Archiv. internac. de laringol., etc.*, Paris, tome ii, 1891, p. 41.
↕ *Thèse de Lyon*, novembre, 1890.
‡ *Thèse de Paris*, 1888.
** *Journal of Laryngology and Rhinology*, 1890, vol. iv, p. 495.
†† *Die Krankheiten der Nase*, 1888.

make it possible to force the septum into place, for which purpose acids and electrolysis are likewise employed.

4. *Incision of the Septum.*—In the correction of deflections confined to the cartilaginous portion of the septum Asch * employs, for incising the most prominent portion of the deflection, a pair of strong cartilage scissors similar to a pair of buttonhole scissors, or much like those employed by Bolton. He then forces the septum into place by Adams's forceps and holds it there until it has become firm by means of a triangular splint wound with absorbent cotton and dipped into a solution of bichloride of mercury, or by plates inserted on each side of the septum and controlled by ingeniously arranged screws. He gives the preference to the former. Asch also employs a hard-rubber tube, with numerous small perforations to afford drainage, to be worn for a considerable time until the parts are healed.

5. *Employment of Pins.*—In deflection of the cartilaginous portion of the septum, J. B. Roberts, † of Philadelphia, makes use of pins for the purpose of holding the deflected portion in place after the resiliency of the septum is overcome by incising it with a knife. He makes a long incision through the septum, from back to front, along the line of deviation or projection. He then passes about two thirds of the length of a long steel pin through the septal cartilage of the normal nostril a short distance above and in front of the incision. Pressing the end of the nose and septum into proper position, he brings the head of the pin close to the anterior part of the septum, thus causing the portion lying in the occluded chamber to lie across the incision and adapt itself lengthwise along the surface of the septum beyond the incision. The pin is then pushed in to the head, and its point is thus deeply imbedded in the soft tissues of the septum and upper and posterior part of the occluded chamber. Two pins are often needed to correct the deformity. In such cases Roberts usually inserts the second one, not from the mucous surface within the nostril, but from the cutaneous surface of the dorsum of the nose just below the nasal bone. The pins are left in position two weeks. The operation, although possessing the advantage of simplicity and effectiveness, will be useless unless the incisions are very free, so as to take away all resiliency of the cartilage.

* *New York Medical Journal*, vol. lii, 1890, p. 675.

† *Medical and Surgical Reporter*, Philadelphia, 1884, vol. li, p. 467.

6. *Fracturing the Septum by Means of Comminuting Forceps.*—Two years ago (June, 1891) I presented for your consideration a new form of forceps for correcting deviations of the septum, which I had had constructed about a year before, and which I have used since that time with very great satisfaction. My forceps consists, as you know, of a male and female blade, the female blade being fenestrated and the male blade fitting into this fenestrum loosely so as not to cut the tissue on the employment of pressure.* The great difficulty attending the use of flat forceps, such as Adams's, is that it only partially corrects the deformity. It merely presses the septum up to the median line, and does not fracture it or sufficiently overcome the elasticity to prevent the septum from springing back to a greater or less degree after the pressure is removed.

Before undertaking the operation of correcting a deflected septum it is necessary to decide as to the advisability or necessity of the operation. Not all septa deflected from the median line require straightening, for the functions of the nose may not be sufficiently interfered with to require it. The first thing to determine is the amount of nasal obstruction, and whether each nostril is capable of admitting half of the normal respiratory current. One nostril may be sufficient to admit more than the normal amount of air required, or there may be sufficient space for respiration to be entirely carried on through that nostril; but the operation will be none the less required if the other nostril can not transmit half of the air respired. When no operation is necessary on account of nasal stenosis, it may, however, be necessary on account of pressure which may exist between the deflected portions and other parts of the nasal passage. In some instances nostrils obstructed by spurs, ridges, enchondromata, or exostoses of the septum will, when these are excised, be rendered sufficiently free for respiration, and at the same time all pressure will be removed. In such cases no operation for the moderate amount of deviation that may exist in the septum will be necessary.

Having determined the necessity of correcting the deviation of the septum, our first consideration is to place the cavity of the nostril—that is, the septum and the turbinated bodies on the concave side of the septum—in a normal condition. It is a common experience to find the turbinated body and also the turbinated bone very

* Since I published the description of my forceps, I notice that T. Smith has described a similar instrument, which is illustrated in the second edition of Greville MacDonald's *Diseases of the Nose*, London, 1892.

much hypertrophied so as nearly to fill the concavity, and in many instances so as to cause more or less stenosis of that side. Although in some instances not sufficiently enlarged to produce any obstruction of the nostril while widened by the deflection, they may none the less be large enough to completely obstruct the passage when the septum is placed in the median line. The removal of this condition of hypertrophy is therefore called for before the straightening of the septum is undertaken. On the convex side we frequently find spurs and exostoses, rendering the septum abnormally thick at the angle of deflection. These are also to be removed and the septum reduced as far as possible to its normal thickness before the straightening is attempted. It is not possible in all cases, however, to reduce the septum to its normal thickness before the operation. This is especially the case in sigmoid deflections. In such instances the angular projections have to be removed after the septum has been straightened.

The fears entertained by many operators, and especially by the earlier operators, lest the laying bare of a considerable portion of the septum by the removal of spurs, ridges, exostoses, and enchondromata would lead to ulceration of the surface, because of the removal of so large a portion of the mucous membrane, are entirely groundless, for in no instance have I found a necrosis of the bone to take place, even after quite extensive destruction of the soft parts, so long as the soft parts covering the opposite side of the septum were intact. The septum receives quite sufficient nourishment from the nutrient vessels of one side to prevent any such result. This is true not only of the osseous portion, but also of the cartilaginous portion of the septum. The plan adopted by the earlier operators of turning back the mucous membrane and the perichondrium before the excision of the cartilage was entirely unnecessary, and the projecting angles of the cartilage can be sliced off with a knife *ad libitum*, so long as the wound is afterward maintained in an aseptic condition; the mucous membrane readily and kindly spreads over the denuded surfaces leaving no traces of the operation. One thing to be avoided, however, is destruction of the tissues with the galvanic cautery. This will almost always leave a mass of cicatricial tissue behind it, which will not be replaced by normal mucous membrane, but which will form a surface for the accumulation of dry crusts, secretions, etc.

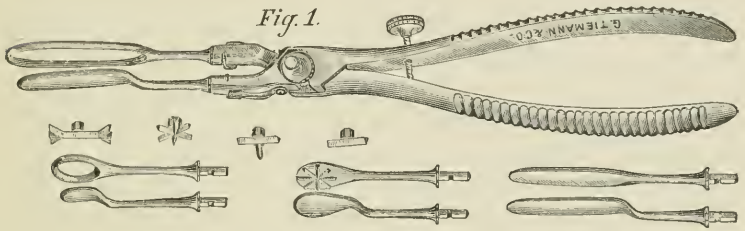
The great desideratum in the correction of a deviated septum is to overcome all elasticity of the tissues that would tend to draw it

back again. The failure of Adams's forceps and all similar forceps to meet this desideratum led me to devise these fenestrated forceps, by which we can not only bring the septum up to the median line, but can force the deflected portion past the center to overcorrect the deformity, so to speak, sufficiently far to overcome the elasticity and so break up the septum without laceration of the soft parts that it can be held in any position desired until the parts reunite and become thoroughly ossified. In the correction of deformities of the triangular cartilage in many instances, particularly if the cartilage is thick, it can be sufficiently comminuted to remain in place after having been held there for a length of time by a supporting dressing. In the majority of cases, however, it is advisable to overcome the elasticity of the cartilage by means of incisions at the most salient point, according to the extent of the deviation. These incisions may be made either with a bistoury or with cutting forceps, such as those proposed by Asch or by Steele. The latter instruments, however, cut entirely through the septum, and when the septum is forced over to the median line the cut surfaces frequently project somewhat irregularly and therefore present an uneven surface on healing. I have found it far better to cut through the cartilage from one side, leaving the mucous membrane of the opposite side intact so as to act as a splint to support the fragments. In order to accomplish this with the least liability of cutting through it, I have frequently employed a bistoury. By placing the finger in the opposite nostril one can detect the proximity of the knife to the finger, and by exercising due care can cut the cartilage entirely through in one or several directions, as desired, without cutting through the mucous membrane on the opposite side. To accomplish this in an easier and quicker manner, however, I have modified the cutting instrument of Steele by placing a set-screw between the blades so as to regulate the distance by which the blades are separated when the instrument is closed. The distance at which the blades are held apart can be very accurately regulated by this screw, so that the cartilage can be cut through without wounding the mucous membrane on the opposite side. It is advisable that the cutting of the cartilage be done from the convex side so that the retaining dressing which should be placed on that side may cover the wound, which can thereby be maintained in an aseptic condition, the opposite nostril requiring no dressing whatever. In those cases in which the cartilage is best held in place by Roberts's pins I adopt this method of making the incisions with the happiest results.

The employment of the punch for the removal of the angular portion of the cartilage I wish also most earnestly to condemn. By its use we simply cut away a deformity which we should correct, and leave a hole through the septum in which crusts and secretions constantly accumulate, thus becoming a lasting source of irritation.

In correcting deflections in the osseous or osseo-cartilaginous portion we must carefully determine the amount of bending the septum will require in order to force it into place. The blades of the forceps are then set by the screw in the shank so as to pass into each other sufficiently far to accomplish this object. The blades of the forceps, which are separable, are introduced separately, the female, or fenestrated, blade on the concave side, the male blade on the convex side. They are then locked, as in the case of an obstetrical forceps, and carefully forced together. Sometimes it may be necessary to make a slight rotary motion in order sufficiently to comminute the septum, but care must be exercised lest we thereby lacerate it. The instrument, as will be seen from the illustration

Fig. 1.



(Fig. 1), may be used with a number of blades of different sizes that fit into the handle.* The blades should be selected according to the amount and kind of deviation. If deflection of the septum is greater in the vertical direction than the length of the blade which the aperture of the nostril will permit to enter, the blades can be separated and moved to one side and a wider portion of the septum grasped and broken down.

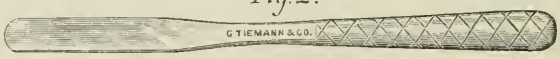
In many cases a twenty-per-cent. solution of cocaine thoroughly applied will be sufficient to render the operation painless, especially

* But two pairs, the largest and the smallest blades, are represented in the cut. Fitting into the same handle are represented a pair of blades for Steele's cutting forceps, together with the smaller cutters that fit into the blades. A pair of blades of Adams's flat forceps are also added to the set. These also fit into the universal handle and are frequently found serviceable after the employment of the comminuting forceps. These instruments are made for me in a very superior manner by George Tiemann & Co., of New York city.

with the use of a little chloroform just at the time of fracturing the septum. In instances where the patient is hyperæsthetic or nervous, and especially in cases where cocaine will not produce complete local anæsthesia, general anæsthesia is required.

After the operation has been performed, whether it be the incision of the cartilaginous portion or fracturing of the osseous portion, the septum should then be placed in the median line. I usually employ a small nasal spatula (Fig. 2) that I have devised for this purpose.

Fig. 2.



A variety of means has been employed for holding the septum in place after the operation, but the plan that I have found to give the most satisfaction to myself and cause the patient the least inconvenience and discomfort is the use of plugs made by wrapping wool or cotton around a small metal plate. The size of the plug can thus be adapted exactly to the size of the nostril and hold the septum in precisely the position desired. The size and shape of the nostrils vary so greatly in different persons that to have ready-made plugs adapted to each case the surgeon would be required to supply himself with a very large number of different sizes and shapes, whereas by this method this necessity can be easily obviated. Thus aside from the utility of the method, it becomes a matter of practical convenience. It matters little what metal is employed, for the reason that the cotton-cover protects it so thoroughly that it is impossible for the metal to come in contact with the tissue so as to produce any irritation whatever. The only inconvenience experienced by the patient is from the obstruction of the nostril; but this is of slight importance, for the reason that the other nostril remains free and unobstructed.

Before the introduction of this dressing every aseptic precaution should be taken. Previous to operating I usually cleanse the nostril thoroughly with a saline solution of bichloride of mercury, in the proportion of 1 to 5,000. After the operation the nostrils should be cleansed with the same solution, or it may be used a little stronger until the bleeding is arrested. It is very rarely that continued bleeding to any annoying extent occurs. When it does take place, however, it can be arrested by exerting pressure on the septum at the point where the bleeding takes place. After the hæmor-

rhage has ceased and the nostril has been thoroughly cleansed with this solution, the dressing is inserted. Before the dressing is introduced, iodoform is freely applied to the nostrils and the dressing dipped in a solution of bichloride of mercury, thus making the nostril as nearly aseptic as possible. The dressing may be left *in situ* for four or five days; at the expiration of that time it is generally necessary to change it. This can be done without any discomfort to the patient by the use of a small amount of chloroform. Again the nostril should be anæsthetized with cocaine, cleansed with the bichloride solution, and dusted with iodoform before reinserting the plugs.

It being necessary in many instances, as we all know, that the parts be held in position for a considerable time to insure their remaining in the proper place, I frequently instruct the patient, after the swelling and soreness have subsided and the soft parts are well healed, to make and insert for himself daily a fresh plug of the proper size. The introduction of the plugs is facilitated by smearing them with carbolized vaseline, which by this time is ordinarily all that is required in the way of an aseptic. The nostril is to be cleansed thoroughly, of course, each time the plug is changed.

The variety of conditions that we meet in the correction of all forms of deviated septa makes it impossible to adopt any one method to the exclusion of others. But I can unhesitatingly say that in all operations for correcting deviations of the osseous and osseo-cartilaginous portions of the septum the method of correcting the deformity by fracturing the septum with my comminuting forceps, with the method which I have described of holding the septum in place after the operation, has been in my hands superior to all other methods and has been attended with most excellent results.

Discussion.

The PRESIDENT: In order to correct deviations in the nasal septum it is absolutely necessary that the elasticity of the septum be broken down, and this can not be done unless you divide it entirely. In my opinion, there is no other way.

Dr. MULHALL: Dr. Roe's instrument seems to defeat the very purpose for which Dr. Steele's instrument was intended, which was to cut entirely through the septum. Unless you cut all the way through, I do not see how you can force the fragments sufficiently far back. It also entails less danger of septic poisoning than by cutting only on one side.

Dr. DE BLOIS: Dr. Leland, of Boston, in correcting these deviations, breaks the septum partly with his forceps and partly with his fingers,

and then inserts a perforated plug of hard rubber. I did it as long as ten years ago in the same way. I inserted an ordinary elliptical tube, with plaster of Paris at the outer end to keep it in place; but, although I did this long before Dr. Leland, I never obtained the universally excellent results that he does.

The PRESIDENT: In a great many of these cases I break down the cartilage with the finger, pushing it through the opening made in the septum, and breaking down each segment at its base.

Dr. WRIGHT: I think the success Dr. Roe has obtained in his cases is truly remarkable. I myself must confess that I have met with many dismal failures. I remember only one case that turned out entirely satisfactorily. I have found it difficult to keep the fragments in place. Without cutting entirely through the septum, I do not see how its resiliency can be broken down. It always springs back. In one case this winter I made a number of parallel incisions with Dr. Asch's instrument, and then used the finger to push the fragments into a straight line, and inserted a very thick drainage-tube, as large as my little finger, and left it in there, changing it every day. It always gave rise to much pain on removing it. I must confess that I am extremely doubtful about the theory of keeping the nose aseptic; I do not think it is possible. Of course, Dr. Roe has had extensive experience in this line, and his word carries great weight. He did not state what he did with the redundant portion of the septum. When you push the convex septum back into its normal position, you have some redundant tissue left. It seems to me that this must be crumpled on itself in order to bring the general contour of the septum to a straight line.

Dr. ROE: In correcting these deviations of the nasal septum we must remember that no one method of operating will apply in every case. We must adapt the operation to the varying conditions found in each case, and no one instrument will serve the purpose every time. In some instances such instruments as I have shown you are not required. Sometimes the osseous portion of the septum is so thin that it can be forced over with the finger or with a smooth spatula, and held there by a retaining dressing. The osseous portions will often remain in place after being held there four or five days. The cartilaginous portion must, however, be freely incised, and, being more resilient, must be held there a much longer time. I have had no trouble with the redundant tissue in these operations. In the osseous portion the bone is simply crushed, while the cartilaginous portion readily adapts itself to its new position. When performing these operations in children I use chloroform, and in adults cocaine; although, if the patient is very nervous, it may be necessary to give a few whiffs of chloroform at the moment of performing the operation.

Paper.

THE USE OF OZONE IN ATROPHIC CATARRH.

By CLARENCE C. RICE, M. D.

THIS paper will necessarily be a short one, since what can be said of the chemical composition, physical properties, and therapeutic value of ozone can be easily read in any chemistry or in pamphlets compiled by the Ozone Manufacturing Company of New York. I have used ozone only during the past two months, and while I can not speak decidedly of its value in the treatment of catarrhal diseases, the results so far have been satisfactory enough to warrant calling the attention of this association to its use in atrophic catarrh.

Dr. William J. Morton, of this city, for whom the Ozone Company have manufactured an extensive apparatus for the generation of ozone, and who has used it for various purposes during the past year, first called my attention to the use of ozone in catarrhal disease of the upper air-passages, and alleged a therapeutic value for it. Before speaking of the therapeutics of ozone and the method of using it in catarrhal disorders, I may give a short history of what is known of its chemical composition and physical properties and describe the methods used for its manufacture. I am indebted to the Ozone Manufacturing Company of this city for the larger apparatus which they have placed here for your inspection, and to Dr. Augustus Caillé, of this city, who has loaned me the smaller apparatus of Messrs. Labbé and Oudin.

Physical and Chemical Properties of Ozone.—In 1775 Van Marum noticed that the passage of an electrical discharge through the atmosphere produced a peculiar odor, but the reason of this was not discovered until 1840, when Schönbein observed that this same odor accompanied the process of electrolysis in acidulated water. He discovered, too, that these odoriferous gases had the power of decomposing iodide of potassium and liberating iodine. By experimentation it was found that ozone was similar to, though quite different from, chlorine. The credit of discovering the true composition of ozone is due to Marignac and De la Rive, who demonstrated that ozone could be obtained by simply passing a current of electricity through pure oxygen gas. In this way it became apparent that ozone could be nothing else than an allotropic modifi-

cation of oxygen. Schönbein named this peculiar gas ozone, from the Greek word ὄζειν, which means "to emit an odor." The knowledge of the present day in regard to the relation between the two kinds of oxygen—O_2 and O_3—has been derived principally from the writings of Professor Tait. As is well known, the chemical formula for ozone is O_3, and it is an allotropic form of oxygen, just as carbon may be found in the allotropic forms of charcoal, graphite, and the diamond. Oxygen may exist in the different forms of O_1, or active oxygen; O_2, or common oxygen; and O_3, or ozone. In the formation of ozone three volumes of oxygen are condensed to form two volumes of ozone—that is, $3O_2 = 2O_3$. In volume, then, it bears the relation to oxygen of 2 to 3. Common oxygen, O_2, when coming in contact with active oxygen, O_1, becomes concentrated into ozone, or O_3. Ozone has been called ozonized air, ozonized oxygen, and electrified oxygen.

From Sir Benjamin Brodie's experiments (*Proceedings of the Royal Society*, 1892, p. 435) it is positive that ozone differs from ordinary oxygen merely in the fact that its molecule contains three atoms instead of two, O–O being oxygen, $\begin{matrix} O \\ \wedge \\ O\text{–}O \end{matrix}$ being ozone.

Ozone is a colorless gas, quite similar in chemical properties to chlorine. It will liquefy at a temperature of 105° under a pressure of 125 atmospheres, and in this form is of a deep blue.

At one time Schönbein advanced the theory, and it was generally believed, that ordinary oxygen gas was a compound made up of two kinds of oxygen, one being positively and the other negatively electrical. Marignac observed that when oxygen was exposed to the influence of electricity it underwent a contraction in volume and acquired very different properties, its chemical activity being greatly increased.

The ordinary way of obtaining ozone is by means of a Siemens induction tube, which consists of two tubes of nearly the same diameter, one within the other. Their exterior surface is covered with tin foil, and this tin foil is connected with the electrodes from an induction coil. The current of oxygen is passed through the space between the two tubes, and is thus exposed to the electrical current. It is said to be very essential that the oxygen which is to be ozonized should be very pure and very dry. Ozone may also be obtained in small quantities by decomposing water with the electric current. Ozone has remarkable oxidizing power. It destroys sub-

stances like rubber, paper, etc. Its effect upon mercury is to deprive it of its mobility so that it will adhere to the surface of a mirror glass. The books tell us that ozone in Nature is principally formed by the action of the sun's rays on oxygen. Schönbein maintains that ozone is the great purifier and oxidizer in the atmosphere, and in a large measure prevents decomposition.

The Ozone Company pamphlet tells us that the utility of ozone as a disinfectant is hinted at by its early discoverer, Schönbein, who in 1851 (*Zeitschrift für nat. Medizin*, Bd. xv, 391) maintained that one part of ozone to 340,000 parts of air was sufficient to destroy the odor of decay in a vessel of 60 litres capacity in which 120 grammes of putrid meat had been placed for a minute, and that Wood and Richardson forced ozonized oxygen through blood in course of decay, and noted that by this means the blood completely lost its offensive smell.

The value of ozone as a bactericide is now under trial by Dr. W. J. Morton and Dr. W. H. Park. I have seen the results of their experiments, but they will be published by these gentlemen later on. Dr. W. Wyssochowicz has recently stated, in regard to experiments with bacterial cultures in ozonized nutrient media, that the ozone effected a change in the nutrition furnished the cultures which prevented their propagation.

The large apparatus for manufacturing ozone, which has been placed at our disposal to-day by the Ozone Manufacturing Company, consists of a dynamo, a blower, a transformer, and an ozone generator proper. The dynamo supplies the current, which then passes for conversion to the necessary high potentiality to the transformer, from which it is conducted by suitable connecting wires to the ozone generator. This latter is constructed of four ozone tubes, placed round and connected by tubes to a central metal pipe, through which the air is received from the blower. The air, passing from thence to the ozonizers, becomes ozonized by the silent electric discharge or effluvium which takes place through the walls of the concentric glass tubes. The blower, driven by a small belt from the dynamo, supplies the air to be ozonized, which, before reaching the generator, is forced through the drying tube. The latter is filled with glass in fine pieces, moistened with sulphuric acid. Ventilators are provided in the sides of the cabinet, containing and supporting the different parts of the apparatus. These are operated by screwing in and out, and they serve to carry off the heat generated by the dynamo when in motion. The longer the air is

exposed to the electric effluvium, the greater is the quantity of ozone produced. The flow of the air may be regulated by the valve which will be found at the lower end of the rubber tube, conveying the air to the generator. The blower being provided with a blow-off valve, there is no danger to the apparatus from overpressure. Experience will soon establish the amount of air necessary to obtain the most satisfactory results. When generating ozone, the tubes of the generator should show, in a darkened room, the blue light of the electric discharge or effluvium. The absence of this light shows that either the commutator or drying tube requires attention. Should the ozone be found too irritating, pass the ozonized air through a two-necked Woulfe's bottle containing a solution of caustic potash—a pound of caustic potash to the gallon of water.

The smaller ozone generator which I present to the association was constructed by Dr. Labbé and Dr. Oudin, and has kindly been sent to me by Dr. Augustus Caillé, of this city. Dr. Caillé has used this instrument quite extensively, and published his observations of its use in a paper entitled Experiments as to the Value of Nascent Ozone in Certain Forms of Diseases of Children, with Demonstration of an Efficient Generator. Dr. Caillé says of this ozone generator that it is made up as follows: "A mild electric current, from a zinc-carbon cell or storage battery, is sent into a Ruhmkorff or spark coil, and from there enters the inhaler, which is a double cylinder of glass, the inner cylinder being closed and holding an aluminum plate *in vacuo* and surrounded by an aluminum cone. The electrical discharge is not in the form of a spark, but presents a diffuse electrical glow." I suppose that the aluminum tin foil simply acts as a conductor for the electrical current, and thus presents a large electrified surface to the oxygen.

Dr. W. J. Morton began to use ozone in cases of nasal catarrh without special regard to the kind of nasal disease. The method employed has been to instruct the patient to take a deep inspiration, and then hold the breath while the ozone gas is allowed to pass into the nostrils through the tube. The current of ozone is passed as long as the patient can hold his breath. The patient is then instructed to blow the ozone out of the nostrils before taking the first inspiration of atmospheric air. The degree of irritation produced by ozone upon the nasal and pharyngeal mucous membrane is in proportion to the volume of gas employed, and depends also upon the purity of the gas used. One of the patients accidentally inspired a

strong current of ozone, and the next day suffered from an aphonic laryngitis.

Ozone in condensed form irritates the respiratory mucous membrane, and may cause active acute inflammation, etc. In Dr. Caillé's paper, already referred to, he states that Messrs. Labbé and Oudin have published extensive experiments in the use of ozone, and that they allege for its use, first, increased metabolism in consequence of the high oxidizing power of ozone, and, second, the destruction of the tubercle bacillus, in consequence of the oxidizing power and extreme diffusibility of ozone, and its ability to reach directly and indirectly the foci of disease in the lung.

Dr. Caillé's experiments with ozone were employed to test its efficacy in the first stages of pulmonary tuberculosis, in extreme anæmia, and in pertussis. His observations extended over five months and comprised twenty-two cases. His conclusions are: That the daily inhalation of ozone increases the oxyhæmoglobin in the blood from two to four per cent. in a short time; that no local improvement was obtained in three typical cases of limited apex tuberculosis, but that, in pertussis, ozone inhalations have a distinct curative effect as regards the duration and severity of the disease. Also that, in anæmia, ozone inhalations are exceedingly valuable from a therapeutic standpoint, and give better and prompter results than any other form of medication. And, lastly, that atmospherical disinfection is readily secured by means of the ozone current, making this probably a valuable procedure in the treatment of diphtheria, scarlet fever, and other infectious diseases.

Before calling your attention to my own cases I wish to refer to a paper written by Henry S. Norris, M. D., of this city. The title of this paper is The Internal Administration of Ozone in the Treatment of Phthisis, with a Report of Cases.* The report has no special bearing upon the object of this paper, except as it shows that the general tone of the patients treated with ozone was improved. The report covers fifteen cases, fourteen of which are put down as catarrhal phthisis and one as fibroid phthisis. The inhalation of ozone gas was not used in these cases, but aquozone and ozonized cod-liver oil were administered. The aquozone was given, four doses daily of three ounces each, before meals, and half an ounce of the oil containing six volumes per cent. of ozone after each meal. The results in many of the cases were beneficial.

Speaking now of the effect of ozone gas when admitted into the

* Norris. *New York Medical Journal*, November 5, 1892.

nostrils of patients suffering from nasal disease, I may say that the first case I observed was treated by Dr. W. J. Morton. He treated this case for the purpose of checking a profuse nasal discharge.

It was a boy of twelve years of age who suffered from apparent nasal obstruction and constant nasal discharge so irritating in character as to keep the upper lip constantly excoriated. He used ozone gas in the nostrils two or three times weekly, covering a period of a few weeks, and the result was that the discharge was almost entirely stopped, the inflamed lip cured, and the patient breathed better through the nose. The patient was sent to me for examination, and I found it to be a case of rather marked adenoid enlargement in the vault of the pharynx. The entire mucous membrane was quiescent at the time I saw him.

I wrote Dr. Morton that in such a case I did not think ozone was as applicable as in atrophic rhinitis, as I believed that the removal of the adenoid would entirely relieve both the nasal obstruction and the pent-up secretions of the nose. It seemed to me that if ozone possessed the powerful oxidizing, germicidal, and bactericidal properties alleged for it, its use would be indicated in those forms of nasal disease which were characterized by decomposing secretions and degenerating tissues, the entire condition possibly depending upon the action of nasal bacteria. Since then Dr. Morton and I have employed the local effect of the ozone gas upon eight different patients, all of them suffering from various grades of atrophic rhinitis and dry pharynx. Of these eight patients, three were treated at the office of Dr. Morton, and he has used a much larger amount of ozone gas than I have at my office. Dr. Morton's apparatus was, as I have said, manufactured by the Ozone Manufacturing Company, while the apparatus at my command is that of Labbé and Oudin. I had the smaller apparatus connected with the storage cells of my cautery battery, and have my patients breathe it into the nose and lungs and exhale it through the mouth. With Dr. Morton's apparatus the current of ozone gas is so strong as to be too irritating for inhalation into the lungs, although it can be modified to any degree. It is hardly necessary to give a detailed history of the cases—that is, the pathological condition in each case—because they are all very much alike.

Three of my cases were advanced to an extreme condition of atrophic change, so familiar to all of you. In two the turbinates had almost entirely disappeared. The septum was ulcerated, and the secretions were collected in thick scabs. Of the two cases I sent to Dr. Morton's office, one was far advanced in atrophic change and

the second was but moderate in degree. All of the cases were treated with the ozone gas from five to eight minutes. In Dr. Morton's cases the gas was passed into the nostrils three times—that is, while the patient was holding the breath for three different periods. The immediate effect of the ozone gas was alike in kind in all the cases, but differed in degree according to the volume of the gas employed, and probably according to the sensitiveness of the nostrils. It produced a mild smarting of the nasal mucous membrane for several hours. It increased the secretions of mucus very markedly for eight or ten hours. The congestion of the mucous membrane of the nose was also exaggerated. In some of the cases, where the volume of gas was large, the patients complained of headache, which, however, had disappeared by the following day. It was almost the universal testimony of these patients that the nasal pharyngeal mucous membrane was less dry, and that the tenacious secretions were more easily got rid of. For the first twenty-four hours after the ozone was used the patient had the symptoms of a cold in the head, but after that the nose felt unusually clear and the mucous membrane more comfortable than before the application of ozone.

The milder cases of atrophic catarrh were very quickly benefited, and remained improved for several days after the inhaling of the ozone, but most of them relapsed somewhat. The benefit was again obtained, however, by the further treatment with ozone. Whether permanent moistening of the mucous membrane and decrease of secretions can be obtained by the use of ozone can be told only after a longer trial. In the more severe cases the benefit was not obtained so quickly. In all the cases we instructed the patient to discontinue the use of all sprays and douches while we were using the ozone. In a case of ozæna treated by this method the deodorizing power of the ozone seemed to be as marked as is obtained by the use of peroxide of hydrogen. The odor from the nostrils was very fœtid, but disappeared altogether after the second inhalation of ozone gas. I have used a preparation called by the Ozone Company "therapol," a combination of sweet oil and 8·75 volumes per cent. of ozone, applying it locally on cotton, with an applicator, in two cases of ozæna, with the result of deodorizing the nostrils.

As to the manner in which ozone may be expected to produce beneficial results in atrophic disease of the upper air-passages, it is known that ozone is an active oxidizing agent, furnishing the active O_1, which is ever ready to seize upon and form itself into new com-

binations. Upon this oxidizing power its germicidal properties may be based. It is possible that in atrophic rhinitis there may be bacteria of a peculiar variety, the destruction of which, if it can be accomplished by ozone gas, will tend to greatly ameliorate the disease. Possibly the irritation produced, which we usually term stimulation, is of therapeutic value.

Paper.

THE CAUTERY IN STAPHYLOTOMY.

By THOMAS AMORY De BLOIS, M. D.

EVEN so small a subdivision as the uvula is worthy of some special study, although I believe its real utility has never been discovered, yet, like the vermiform appendix, it is unquestionably "there," seemingly unemployed except for evil.

As a complication of pharyngitis, it is, in its state of inflammation, or œdema, decidedly unpleasant; irritating the pharynx, acting as a kind of ball valve to shut off respiration, it makes its presence known constantly.

As the after result of many inflammations, as it hangs limp and flaccid in the pharynx, it is again neither useful nor ornamental.

Although I have never had the opportunity of seeing any of those historical cases of elongation of the uvula, in which it was so long that it could be caught between the front teeth during coughing, yet I have seen it sufficiently long to tickle the epiglottis.

And I take this opportunity of advancing the opinion that elongation of the uvula is a lesion of civilization. I have always held the belief that the "dude was catarrhal," and this is evidently coincided in by the caricaturists of the present day, great students of Nature, who usually depict him with mouth wide open, or else sucking his cane, a continuation of the infantile thumb, which we are told causes the high-arched palate and salient incisor teeth. If you will look back over your professional experience you will, I think, remember that your cases of amputation of the uvula have been generally among the better class of your patients rather than the poorer ones. Thus during a winter's hospital practice of six months I only saw one case (which did not belong there) where operation was indicated, whereas I might report half a dozen from my office practice—and I did not remove the uvula many times

when I should have done so. Persons who are well fed on rich food are apt to be indolent; perhaps they acquire gout and rheumatism; at any rate, they appear to be subject to pharyngitis, and the same catarrhal relaxation which is present in the pharynx also obtains in the palate and uvula.

The uvula may to a certain extent be toned up and retracted by astringents, faradization, etc.; but if the trouble has been of long standing, removal of a part of the body is certainly indicated. The little operation is certainly one of the simplest, but, as whatever we do had better be done well, I would like to recite to you a little procedure which I have made use of during last winter, not that I suppose it original (for "there is no new thing under the sun").

Troublesome hæmorrhage after amputation, such as our late fellow Dr. Morgan once reported, is very rarely met with; but after snipping with the knife or scissors there sometimes is a quite persistent oozing, which will keep up in spite of all the ice or astringents you can put there. Then, again, the uvula may be very thick and large and would seem to indicate large vessels, a good deal of muscle, and more after-sloughing than one cares for. It was just such a condition of things as this which induced me to operate on A. B., on December 6th, with the galvano-cautery.

Many applications with a twenty-per-cent. solution of cocaine were first made until the part had become blanched and was apparently anæsthetized; then, placing a tongue depressor on the tongue and giving it to the patient to hold, I passed a fixed loop of platinum wire around the uvula rather high up, for I observed that the cocaine had retracted it.

As soon as the cautery was felt on the posterior surface of the uvula it was drawn tight by the palate muscles, and by pulling in an opposite direction with a forceps I was enabled to bevel the cut very nicely, so that when the wound healed it was well "tapered" and was more of a work of art than the "clubbed" stump which we see after clipping with the scissors. This first patient was a preacher, and his trouble may have been the sequence of ministers' sore throat.

Case II was that of a lawyer, B. C., on December 17th. He not only talked but smoked; he was something of an athlete, but not robust. I used the cautery with him because I had had a good result with Case I. The procedure was the same. The patient complained of very little pain, but there was the same reflex contraction of the palate. The result was better than before.

Case III was that of a shopkeeper, on January 30th. This man did not smoke, but used his voice in his business a great deal more than necessary; his uvula was very "dejected." The weather was cold, and I had unfortunately discovered that my gravity battery was useless in cold

weather. I therefore had to use a small primary battery and a much smaller loop than before. My current was poor and I had to stop and cocainize after I had cut through the mucous membrane.

As before, I tapered from back forward, and from the sides toward the point. The result was good; the recovery not delayed.

Case IV.—I will only weary you with one more case, that of Mr. C. D., a French restaurateur, on February 2d. This was a case of peculiar formation; there appeared to be a kind of permanent erection to the uvula so that it stuck directly to the front; then it twisted to one side with a kind of curl in it like a pug dog's tail. It was difficult to cut properly, and after I had burned through this huge, thick uvula I found that I had beveled the anterior instead of the posterior aspect.

The result after healing was quite good, and I presume that the flavoring of his ragouts went on as well as before. His pharyngitis certainly went on better.

These were done with the fixed loop. Had they been cut with the galvanic snare (which winds on a reel) the cut would of necessity have had a straight surface and not a continuous bevel.

It seems almost puerile to waste so much time on so small a subject, but the artistic stump is well worth the extra trouble.

Discussion.

Dr. Casselberry: I should like to ask Dr. De Blois if the pain following the operation by means of the galvano-cautery is not more severe than in cases where the uvula is simply clipped off with the scissors?

Dr. F. I. Knight: It has always seemed to me that the use of any instrument which simply cuts the relaxed mucous membrane of the uvula transversely was wrong. It leaves a very painful sore. For years I have always drawn the relaxed membrane so well forward that when I use the scissors the cut is an oblique one and the raw surface presents entirely behind, as in Dr. De Blois's operation. We should have that object in view—to get the raw surface behind, and as a result there is almost no soreness on deglutition. Dr. De Blois spoke of cutting the muscle; it seems to me the object is only to cut the relaxed mucous membrane.

Dr. De Blois: In reply to Dr. Casselberry I would say that I had my own uvula cut with the scissors; it was cut off perfectly square, and for about four days I suffered very much, and was nearly starved. By the use of the galvano-cautery I have not yet seen any patient who suffered as much as I did. As regards Dr. F. I. Knight's remark concerning the structure of the appendage, I always supposed that the azygos muscle ran to the very tip of the uvula. I usually cut it off within half an inch of the velum.

Paper.

SALIVARY CALCULI, WITH REPORTS OF CASES.

By CLINTON WAGNER, M. D.

ALTHOUGH cases of salivary calculi are of very infrequent occurrence, still quite a number of cases are on record. The first of which I have found mention dates more than two centuries back. In my practice, extending over a period of more than thirty years, I have had only three cases, and assisted in the operation for the removal of a fourth at a clinic with which I was connected.

These concretions are formed by the deposit of earthy salts (chiefly the phosphate of calcium) from the saliva in the excretory ducts leading from the gland or in the body of the gland itself, in which case the pain is greater and the removal of the calculus more difficult. The cause of the deposit is an obstruction to the flow of saliva either to or through the excretory duct. I do not think that the gouty or rheumatic diathesis is a factor in the development of the concretions.

They are most frequently found in the sublingual gland or its excretory duct, the duct of Bartholin, and may be recognized by a tumor under the tongue on one side or the other of the frænum; it is sensitive upon pressure and is sometimes but not always fluctuating. If the body is lodged in Wharton's duct, in addition to the sublingual tumor there will be enlargement of the submaxillary gland; non-enlargement of this gland indicates that the concretion is lodged in the duct of Bartholin. The concretions are sometimes found in Stenson's duct, in which case there will be enlargement of the parotid gland.

The subjective symptoms are pain and difficulty in mastication and deglutition, with more or less impairment of speech. When the parotid and submaxillary glands are inflamed from the presence of these bodies the pain at times is agonizing.

In a case of suspected calculus in a sublingual tumor where there is fluctuation, a free incision should be made in order to give vent to the fluid contents; the calculus, if there is one, will probably be released from the duct and will escape through the opening made by the knife. If the tumor is solid and firm, a small opening should be made for the introduction of a very fine probe, with which an

exploratory examination may be made; if a calculus is felt, the incision should be freely enlarged and a small forceps introduced with which it may be seized and removed. I think that many of the so-called cases of ranula are caused by small calculi impacted in the duct of Bartholin. When the calculus is imbedded in the substance of the submaxillary gland its removal is attended with great difficulty.

Dr. J. Mason Warren, of Boston,* attempted the removal of one by external incision and failed; he finally reached it by incision through the mouth and removed it piecemeal with a small polypus forceps, the patient having first been put under the influence of ether.

In the first case of salivary calculus that came under my treatment the patient consulted me about twenty-three years ago, a man aged forty-five years. He stated that three years before coming to me a swelling began under his tongue which slowly increased in size. At the time of consulting me it was painful and interfered greatly with speech and mastication. The tumor was fluctuating and on the right side of the frænum. I made a free incision, from which escaped about half an ounce of a viscid, semi-transparent fluid and a calculus. There was no enlargement of the submaxillary gland. The concretion had lodged in the duct of Bartholin. It weighed eight grains and was composed mainly of phosphate of calcium and organic matter. I sent it to the Army Medical Museum at Washington, and it is numbered 5,735, Section 1, in the collection.

Case II.—Colonel W., aged sixty-five years, a retired officer of the army, stated that for over two years he had experienced pain and discomfort from a swelling under his tongue, with an enlargement externally. An examination disclosed a sublingual swelling to the right of the frenum, and also enlargement of the submaxillary gland of the same side. No fluctuation could be detected in the sublingual tumor; on the contrary, it was firm and quite sensitive upon pressure. Suspecting a calculus in Wharton's duct, I made a small incision, and after a careful exploration with a fine probe I detected a hard body; and upon enlarging the incision I had no difficulty in seizing and removing a small calculus weighing seven grains. The sublingual swelling disappeared with the removal of the concretion, but the submaxillary enlargement remained. Several weeks later I introduced an exploratory needle into the body of the gland through the mouth, but did not discover another calculus, as I thought might possibly be the case. The swelling of the gland, I learned afterward, disappeared in course of time.

Case III.—Mrs. B., aged thirty-six years, applied for treatment at

* *Surgical Observations.* J. Mason Warren, M. D., Boston, 1867.

the Metropolitan Throat Hospital. She stated that for eighteen months she had been annoyed by a swelling under her tongue which was painful and interfered with mastication. An examination revealed a firm, hard tumor, sensitive upon pressure, and to the right of the frænum; there was no enlargement of the submaxillary gland. An opening was made sufficiently large to admit a small fine probe, and after a few minutes' careful search a hard body was felt. The incision was enlarged and a small calculus removed from the duct of Bartholin weighing four grains.

Some years ago at the London Throat Hospital I had an opportunity of examining and assisting in the operation for the removal of a very large calculus from the duct of Steno. As it is the largest salivary calculus on record, and as the report of the case has not, that I am aware of, been republished in this country, I quote it in full:

Salivary Calculus removed from the Orifice of the Parotid Duct. By John C. Thorowgood, M. D.*

J. K., aged seventy years, presented himself for treatment at the Hospital for Diseases of the Throat. An examination discovered a tumor of the size of a large walnut at the ramus of the inferior maxilla on the right side, very painful on pressure and accompanied with difficulty in deglutition and articulation, slight dyspnœa, and inability to open the mouth widely.

He gave his history as follows: The swelling was first noticed twelve years ago; there has been discharge of pus into the cavity of his mouth, and about four years ago an abscess pointed and discharged externally. He states that he has attended various hospitals, but the presence of the calculus was not detected, attention having only been directed to the external abscess and swelling.

Dr. Prosser James, on examining the mouth, observed a small white circular patch, about a fourth of an inch in diameter, lying external to and near the ramus of the inferior maxilla. When touched with the finger, acute pain was felt by the patient, and having arrived at the conclusion that it was a concretion, Dr. Prosser James, with the assistance of Dr. Clinton Wagner, proceeded to remove it by dividing the firm structures which grasped it by means of a curved bistoury and then withdrawing the mass with the forceps. The cavity in which it had lain was felt by the finger to be quite empty, and in a week the man came back expressing himself to be quite comfortable, able to take solid food, and beginning already, he thought, to regain some of his lost flesh.

The calculus now exhibited weighs ninety-three grains and a half, is an inch and an eighth long and two inches round, and is composed mainly of phosphate of calcium.

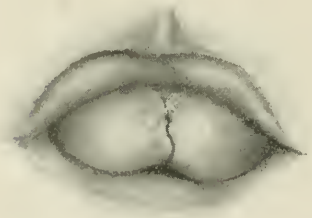
* *Transactions of the London Pathological Society*, vol. xxiii, 1872.

Paper.

PHARYNGEAL VOICE: ILLUSTRATED BY PRESENTATION OF A PATIENT WHO PHONATES WITHOUT A LARYNX AND WITHOUT THE USE OF HIS LUNGS.

By J. SOLIS-COHEN, M. D.

WE are all aware that every now and then Nature has ways of restoring a function that has been destroyed by disease or surgical procedure in a manner which is very surprising and unexpected. I show you a very remarkable instance of that in this patient, from whom, fourteen months ago, I removed the larynx (leaving the epiglottis) and the first ring of the trachea for a cylindrical epithelioma. The case was reported to this association last year, shortly after the operation. In order to prevent as much as possible a septic pneumonia, I stitched the trachea to the skin by several sutures of silk, and since then there has been no communication whatever between the trachea and the mouth. Some months after the operation I found that the man was able to make a clucking sound. I encouraged him in this as a factor in making himself understood, and he has succeeded to a wonderful extent. His larynx should be here; it was sent by express from Philadelphia yesterday and ought to have been delivered this morning, but it has not yet arrived. I will ask this man to speak to you in a few moments, and you will notice then that he swallows the air and a little bag of skin is formed in the neck just above the tracheal orifice, which is utilized as the motive power of phonation. Where his voice comes from I do not know positively. He says it comes from down here, below, just above the bag of air in the neck. In all probability the constrictor muscles of the pharynx are utilized as phonating reeds set in vibration by the air as it escapes from the sac in the neck. I have examined the patient carefully while phonating time and again, and know positively that the new phonating reeds are not the posterior palatine folds, as I thought at first, nor are they the epiglottis and a transverse fold of the pos-



terior wall of the pharynx. Dr. Lefferts, who removed a papilloma from the man's larynx eighteen years ago, says he thinks the man phonates with the tongue and lips; certainly not with the epiglottis. He can produce the sounds while the laryngoscopic mirror is in position, and the voice does not come from the region of the larynx. His voice is modulated much better than it would be by any artificial instrument.

Another curious feature of the case is this: After the operation a slight fistula remained in the track of the wound. In order to close it I inverted the skin and fastened it together, and on those inverted flaps of skin the hairs of the beard have continued to grow. Upon examining the man, you will see that along the line of the cicatrix is a white stripe to which my attention was first called by my assistants, who thought it might denote a recurrence. I am satisfied now that there is no recurrence, but that the epithelial tissue is undergoing some change. This man sleeps without any tube. The manner in which the trachea is united with the skin dispenses with the necessity for a tube. He prefers to wear it during the day, because it gives him some support, and he speaks better with it. It seems to give a fulcrum from which the expulsion of air from the sac is better controlled. After the operation I nourished this man *per rectum*. I stitched the trachea forward as you see, and during the two weeks of treatment kept the bed tilted so that the head was lower than the shoulders, and the fluids, by gravity, went out of the wound instead of down into the lungs. There was no dressing whatever applied to the pharynx; not even a bit of gauze. Shortly before, I had a case with Dr. Gleitsmann which terminated fatally, in which the patient was very much troubled with efforts to swallow by reason of the packing in his pharynx. In this case I saved the patient from that trouble. The wound was loosely brought together with stitches and allowed to granulate. There has been no pain since the operation.

Discussion.

Dr. Lefferts: Eighteen years ago I removed a papilloma from this man's larynx, and for ten years or more he was perfectly free from any signs of recurrence.

I do not know that I can add anything to what Dr. Cohen has said and to what will be demonstrated by an examination of the patient. The examination will speak much more strongly than any words of mine. I think the result that I saw there this morning is an exceedingly interesting and favorable one. There are no signs of any recurrence of the

growth, but the appearance is very curious. The parts are exceedingly difficult of identification.

The question of main interest to me at present is how the man articulates. I think you will all agree with me that it can only be by the use of the lips and tongue; this can be seen if you watch him closely. I had him phonate with his mouth wide open, and the pillars of the fauces remained motionless. Of course, it is out of the question that any sound comes from the region of the larynx.

Dr. Delavan: I think that the voice with which this man speaks is vastly superior to the artificial voice produced by a mechanical larynx, for the reason that with the latter the voice is so artificial, resembling as it does a boy's toy whistle.

There is one point in connection with Dr. Solis-Cohen's case which I consider one of its most important lessons. The case was not treated antiseptically. To my knowledge, two somewhat similar cases operated on in this city nearly died from iodoform poisoning. In a case of my own, operated on by one of our prominent surgeons for epithelioma of the tonsil, death almost resulted from the same cause. Fatal cases have been reported by foreign surgeons. The area of the wound left by the operation is so enormous that it is not difficult to suppose that rapid absorption of the drug may take place. In view of this danger, some substitute for the iodoform dressing might be used or the wound be treated without such dressing, as Dr. Cohen has indicated.

Dr. Wright: I think it is impossible to keep a wound in this location aseptic. It is useless to attempt it. The wound communicates with the mouth, which is the source of all evil in the bacteriological way.

Dr. Langmaid: I can not agree with Dr. Lefferts that the sound this man makes is produced by the tongue and lips. From the very superficial examination I have made, I am of the impression that the voice is produced by vibrations of the soft palate, which obtain re-enforcement in the nasal and buccal cavities. The articulation sound is produced by the teeth. It would be very interesting to notice what consonant sounds he is unable to produce. I hope it will be possible for Dr. Cohen to put this patient through a regular course of vocal production to see what he can do and what he can not do in the way of the gamut—the elevation and depression of tone.

Dr. J. Solis-Cohen: Of course the articulation is done by the tongue and lips, but the phonetic reed must be lower down. There is some tissue that is producing the sound. For the production of sound all we need is something to vibrate. Perhaps in this case the distended pharyngo-cutaneous structures act as a supplementary lung, driving the air through this phonetic reed, whatever it is, and the sound is articulated by the tongue and lips into speech, as in the normal condition.

Paper.

REMARKS ON CONGENITAL DEFECTS OF THE FACE, WITH EXHIBITION OF A RARE FORM OF CLEFT PALATE.

By HARRISON ALLEN, M. D.

I HAVE here a skull, and in connection with it a drawing, which illustrates a rare form of congenital defect. The specimen is the skull of a Seminole Indian taken from the Morton Collection in the Philadelphia Academy of Natural Sciences. The collection is for the most part made for ethnological purposes, and this particular skull shows evidences of having been exposed to fire, which probably indicates a pre-Columbian burial rite.

The defect in the palate is directly in the median line. In other words, it is not the form of cleft palate which is generally described. The cleft palate which we know of from the books is the result of the failure in the descent of the fronto-nasal process to reach a level with the other bones of the face which are developing from the sides. There may either be one or two fissures, resulting in double or single cleft palate. The rudiments of the incisor teeth lie between the clefts. This specimen is so far different that on the right side there are distinct sockets for the incisors. On the left side the sockets for the incisors are absent. We have evidence that the cleft in the roof of the mouth itself is distinctly in the median line. On turning the specimen, so as to get a front view, it will be seen that the maxillæ descend unequally, the one on the left side being carried down further than the one on the right. There is a disproportion between the two sides of the face. It will also be seen that the septum is exceedingly irregular, one of the nasal chambers (namely, the left) being much narrowed. The septum is deflected in a remarkable manner, so as to form a gross deviation to the left.

The right nasal chamber is intact. The individual suffered only on the left side from the result of the cleft. Here is a large fissure opening from beneath, and the left nasal chamber is freely continuous with the mouth. It is evident, from the appearance of the teeth, which have been subjected to full use, that these peculiarities did not interfere with the individual's masticating powers. The spur formed by the union of the perpendicular plate of the ethmoid bone with the vomer is deflected so far to the left that it has formed an adventitious depression for its reception in the left middle turbinal bone. I wish to dwell upon this point, for I have long been of the

opinion that many forms of nasal headache, catarrh, and distress are due to similar pressure effects. I know that some of the fellows of this association do not accept this thesis, but I think that a study of the specimen will help strengthen the position I have taken. It is difficult to see how this spur could avoid making sufficient pressure on the turbinated bone to excite distress. This is certainly true of patients who have an irritable nervous system, and it might have been true here. In my experience, when the middle turbinated bone is cauterized, particularly on the side, it creates a hygroscopic eschar which becomes thick the day after the operation and produces headaches. These are relieved only on the removal of the eschar.

When the subject of the ætiology of deviations of the nasal septum was first studied they were attributed almost entirely to injuries. I remember when I first read a communication on this subject before the Philadelphia Medical Society, there was no one present who agreed with me that such deviations were due to other causes than traumatism. It is difficult to prove that they are not due to traumatism, because few children escape blows on the face. The history of a blow is all that is needed. I acknowledge that it is exceedingly difficult to make the contrary proposition good, but I have been inclined of late years (perhaps because my experience with these cases has been an exceptional one) to the opinion that deviations of the nasal septum are very rarely traumatic; that they are almost always congenital and, like most congenital conditions, are associated with a disposition to minor defects in more than a single direction. Ordinarily, indeed, the entire region of the face, including the superimposed frontal bone and the roof of the mouth, exhibits peculiarities which correlate with nasal conditions. I endeavored to establish this proposition many years ago, but practitioners are indifferent to data of this kind.

Examining the specimen for details, we find that the middle turbinated bone is of enormous size on the right side, while on the left side it is a mere wafer-like scale. These bones show no evidence of being peculiar from behind, while in front they present marked asymmetry. This illustrates the law that all structures grow in the line of least resistance.

Discussion.

Dr. Wright: I have been very much interested in Dr. Allen's remarks. It seems to me that the late explanation that has been made,

particularly by some French and German writers, regarding these deviations of the septum is very plausible indeed. We see so many of these cases that give no history of any severe injury that it has weakened our faith in the belief that they, as a rule, are due to traumatism. On the other hand, there are cases which are clearly due to a blow on the nose, with no history of previous stenosis. As regards the bony septum, to which probably Dr. Allen refers, it is almost incredible that any injury could be severe enough to cause deviation of it, because it is so well protected by the soft parts. The highly arched palate that we see in these cases, and see so often in the Caucasian race and so seldom in the negro and Indian races, leads us to a solution of this problem. It is probably due to evolutionary changes in the development of the bones of the face, and this has been dwelt on by some French observers, who show that the approach of the floor of the nose or the bony roof of the dental arch to the base of the skull has been greatly increased, and, in order to allow the septum room for its superfluous tissue, it must undergo curvation.

Dr. Delavan: Experiments made on rabbits have tended to confirm the theory that these deflections of the nose often were not so much due to traumatism as to defective nutrition. One of the chief of these well-known experiments consisted in stopping up one nostril in the rabbit until the animal attained its maturity; there was then found to be a distinct difference between the two sides of the face.

I have for years taught that retro-nasal obstruction or nasal obstruction which would deprive the nose of its normal amount of air would produce this same result. I think that very often in these cases, where one nasal cavity is very much more spacious than the other, the nutrition of the defective side has been interfered with. Traumatism, in my opinion, while an important factor in the ætiology of nasal deformities, is not the sole, nor in fact the chief, cause of many of these nasal and septal asymmetries, and I think that we can not recognize the fact too thoroughly.

Dr. Allen's paper has been a most interesting one. There is probably no one else who could have instructed us to the same extent and in quite the same way.

Dr. Mackenzie: This matter can be simplified by dividing the causes of such deviations into congenital and acquired. Most of them are of congenital origin, but of those which are acquired, the majority are due to traumatism. I fully agree with Dr. Allen in what he said as regards the asymmetrical condition of the nasal cavities.

Dr. Porcher: One word about the causes of deflections of the nasal septum. A great many explanations have been given to account for their presence, and it appears to me that traumatism is one of the least frequent of all the causes. Most of these deflections, I think, are due to inflammation of the subchondritic type or otherwise, and the curvature occurs as a necessary result in order to make room for the tissues

resulting from swelling and inflammation. As it is impossible for the septum to extend itself in an upward or downward direction, it must necessarily become deflected either to the right or left.

Dr. ALLEN: As regards the point made by Dr. Porcher, that we may have deviations of the septum from inflammatory processes, I agree with him. A congenital condition of this kind may be made very much worse by acquired conditions. All these elements may be present in the same case. One does not exclude the other.

That we may have elevation of the hard palate with obstruction of the nasal respiration is undoubted, and one can well be surprised at the rapidity with which these deviations occur. Sometimes the change occurs very rapidly after an attack of acute influenza or "cold" in persons whose nutrition is poor. I have seen children with acute amygdalitis followed by acute coryza or rhinitis develop a depression of the sternum and an elevation of the ribs in the upper part of the chest within a fortnight.

In the remarks I made I did not cover the whole ground of deviations of the nasal septum, but limited myself to a few statements. It goes to show how very complex the subject really is. There is much work still to be done on the subject before we understand all the causes which lead to impeded nasal respiration and the ætiology of deformities of the face.

Paper.

AN IMPROVED METHOD OF DRAINING THE ANTRUM OF HIGHMORE.

By GEORGE W. MAJOR, M. D.

AT the regular fortnightly meeting of the Medico-chirurgical Society, held on November 11, 1892, I explained, in the course of a discussion on antrum disease, a method of operating upon and draining that cavity. A brief *résumé* of my remarks appeared in the *Montreal Medical Journal* for February of this year; but, as I supplied no particulars to the publishers, I take this opportunity of presenting the several points in detail to the fellows of this association. In doing so, however, I do not wish to convey the idea that I am offering an altogether new procedure, although in some respects, perhaps, differing from the methods usually described in the literature of the subject.

Some years ago I tabulated one hundred and eighty-nine cases of myxomatous nasal polypi in which antrum disease presented itself in thirteen instances.

More recently I have a record of eleven examples of antrum dis-

ease in which myxomatous polypi of the nose occurred in seven cases, and hypertrophy of the middle turbinated body in the remaining four. In one of these latter—a case which had been previously operated upon through the inferior meatus, in Paris, without any perceptible benefit—double empyema of the antrum was observed; the only instance in which I have observed disease of both sides. That the disease may be intermittent I have no reason to doubt, as I have within the past six months had under my care a patient in whom the discharge only occurred when some acute inflammatory process affected the nasal passage, and in whom, after removing an excess of hypertrophied turbinated tissue and an outgrowth from the septum, the discharge has altogether ceased. So that in all cases I would recommend the removal of nasal obstructions of whatever nature before resorting to the opening of the antrum.

I do not propose to discuss the merits or demerits of making an outlet for the discharges through the nasal passage, but can not refrain from remarking that it seems but reasonable to hold that the counter opening for drainage should be at the lowest possible point attainable, and that, unless very good and sufficient reasons exist to the contrary, this opening should be through the alveolar region. The presence of a diseased tooth is not always an essential concomitant, but the morbid action produced by a diseased tooth, although the tooth has been extracted, may be so perpetuated as to keep up a constant discharge, extending over, as in one instance, a period of twenty-nine years.

A discussion as to whether diseased teeth are the sole and only cause of antrum disease does not properly come within the scope of this article. I may be permitted to state it as my experience, however, that diseased fangs are the most prolific cause, and that the myxomatous degeneration of tissue found so often in the neighborhood of the ostium maxillare is secondary to the antrum disease. On two occasions I have succeeded in tracing empyema of the antrum as the direct sequence of frostbite of the cheek. Occasionally the swift removal of a diseased tooth and the temporary drainage thus acquired may be all that is necessary to check a discharge. This class of case is somewhat rare, and an opening of a more or less permanent nature is usually called for.

Method of Operating.—When a suitable space is found in the jaw from which a tooth has been previously removed, I apply a ten-per-cent. solution of cocaine, and proceed to drill the bone without

further preparation. The instrument I have been in the habit of using for perforating the jaw is simply the ordinary twist drill used by machinists, filed down at the shank so as to fit a dental hand-piece. An electric motor is employed for working the drill. The time consumed in perforating does not exceed a few seconds, and the procedure is absolutely painless. I prefer to drill in a slightly oblique direction from before backward; my object in doing so is the better to facilitate the retention of the drainage-tube. The diameter of the drill selected varies somewhat in each particular case. I usually employ two sizes only—viz., five thirty seconds of an inch and three sixteenths of an inch, the latter preferred.

Immediately after withdrawing the drill, the cavity being cleared of secretions, a piece of soft pine wood, previously whittled down to a size slightly smaller than the drill and with a protuberance at its lower end, is inserted into the opening. A paste of plaster of Paris of proper consistence for taking a cast of the upper jaw is now applied by means of an impression cup and allowed to set. When ready for removal it is gently withdrawn, and with it the wooden plug firmly held in the cast.

The object of using the wooden spile is to get the exact direction of the opening in its relation to the margin of the jaw.

A metal alloy, fusible at a low temperature, is now poured into the cast and a model of the upper jaw with the opening in position is the result. The model is handed to a mechanical dentist, and upon his skill and ingenuity we must largely depend. The drainage-tube I keep on hand in sizes to suit the drills employed, a shade smaller than the latter, however, so as to allow for any swelling and consequent contraction in the caliber of the opening, a suitable length of which is supplied the dentist. The tube is made of pure gold and is drawn to order by a working jeweler.

The tube should at first be of sufficient length, when *in situ*, to stand slightly above the level of the floor of the antrum.

If shrinkage in the length of the opening occurs, as is especially likely when a tooth has been extracted very recently, the tube can be subsequently shortened at its antral end. It is well at first to have a tube fully long, as otherwise the drainage may be interfered with by the valve-like action of the recently torn mucous membrane, or by granulation tissue at some period subsequent to the operation.

A sheet of gold beaten out on the metal model will be an exact fit for the gum in the neighborhood of the opening. The gold tube

passed through the opening in the model is soldered to the plate and the drainage-tube proper is complete.

When but a single tooth is wanting a pair of arms may be made to loosely encircle the tooth posterior to the space. This will be found sufficient to hold the drainage-tube securely in position, as the oblique direction of the opening in the bone gives to the appliance a counter pressure. When a greater number of teeth are absent the gold base is to be imbedded in a suction plate of vulcanized rubber, to which small clamps may be attached to secure it to the teeth fore and aft. When a plate containing a number of false teeth, or even a complete set, is worn, the tube with its base is readily attached.

For washing out the antrum, I procure an ordinary single-bulb enema syringe (such as Davidson's No. 1, with metal fittings), and file down to a conical point one of the attachments so as to make it perfectly fit the opening in the drainage-tube.

By means of such an arrangement sixteen ounces of liquid may be made to pass into the antrum and escape at the ostium maxillare in less than a minute. To prevent the entrance of food into the antrum, the tube is fitted with a vulcanized rubber plug so designed as to present a rounded head at its lower or buccal end sufficient to prevent its slipping into the tube and to render it easy of removal with the fingers. The tube may be removed at pleasure for the purpose of being cleaned, but should not be allowed to remain out for any length of time, as the opening will be found to contract very rapidly. In my opinion, too small a tube is a mistake, as thickened secretions will not flow so readily as in one of larger caliber. For washing out the antrum I ordinarily employ a solution of boric acid in warm water, and direct the patient to wash out the cavity every three or four hours for the first few days. Peroxide of hydrogen, in varying strengths, I have found to be too irritating for long-continued employment. Where the secretions continue thick and tenacious, an alkaline solution to which a little carbolic acid is added is often useful. For dry dressings I use insufflations of iodol or of iodol and boric acid.

I wish to express my indebtedness to Mr. J. C. Nichol, surgeon dentist of this city, for valuable assistance and practical suggestions offered me in the carrying out of the mechanical treatment of diseases of the antrum during the past sixteen years.

Paper.

ON SOME OF THE MANIFESTATIONS OF SYPHILIS OF THE UPPER AIR-PASSAGES.

By J. H. BRYAN, M. D.

SYPHILIS affecting the mucous membrane which lines the upper respiratory tract manifests itself in so many different ways, and is of such interest to the surgeon, that a report of a few cases illustrating some of its rarer manifestations may be of interest to the association.

Case I. *Syphilitic Stenosis of the Larynx.*—This was a particularly distressing one, occurring in a lady of high social standing, who acquired the disease through her husband. Owing to the difficulties in the way of getting a history of her trouble, the disease had steadily increased, making severe inroads upon her system before it was recognized. Before coming under my care it was stated that she had been treated for three years for tuberculosis of the larynx. When first seen by me she was greatly emaciated and scarcely able to walk without assistance. There was great difficulty in breathing and almost complete aphonia. She was greatly annoyed by a distressing cough, which was accompanied by an expectoration of a thick, ropy mucus. The paroxysms of coughing at times were so severe as to threaten life.

Examination revealed the mucous membrane lining the fauces, the larynx, and the pharynx to be of a very pale appearance. In the post-nasal space there was a large cicatrix on its posterior wall, the result of a former ulceration. The right half of the epiglottis had been destroyed by an old ulceration which had healed. The ventricular bands were infiltrated to such an extent as to almost completely obliterate the lumen of the larynx, leaving a very small opening posteriorly, which served for the passage of air and expulsion of mucus.

It was ascertained that some years ago she had had an eruption on her face, and had also suffered from rheumatism, for which she received treatment at the Warm Springs of Virginia.

Auscultation of the chest revealed numerous large and fine râles due to the pent-up mucus which the patient was able to expel only in small quantities.

A bacteriological examination of the sputa gave negative results.

The patient was urged to submit to intubation, with the belief that it was the readiest method of obtaining relief in her then critical condition, but at the earnest solicitation of her family it was postponed in order to give internal medication a fair trial. Accordingly, the patient was given a saturated solution of iodide of potassium, the dose of which, beginning

with fifteen grains, was gradually increased to the point of tolerance, which was found to be eighty grains in the twenty-four hours. Within a few days the patient expressed herself as feeling relieved, the breathing became easier, and the cough and expectoration much lessened. The improvement continued, and in the course of two months the infiltration of the ventricular bands had so far disappeared that a good view could be obtained of the interior of the larynx and the upper part of the trachea. The vocal cords were found to be almost completely destroyed, and in the trachea were semicircular bands of cicatricial tissue as far down as could be seen.

The patient gained rapidly in flesh and strength, and in the course of six months she was able to walk several blocks without assistance. The dyspnœa, although still present, was greatly reduced in intensity, and the voice, which was nearly absent, was so far restored that she could speak in husky tones.

I have recently seen this patient, who has been absent from the city for nearly two years, and her condition is much the same, the stenosis not having returned.

Case II. *Syphilitic Amygdalitis undergoing Suppuration.*—Mr. ——, aged forty-five years, consulted me in October, 1891, for tonsillitis, stating that for several weeks there had been a great tenderness in the throat and difficulty in swallowing. A specific history was denied.

Examination showed intense congestion of the fauces with enlargement of the left tonsil, the latter presenting a grayish appearance on its free surface. The patient had not been under observation more than a week before a macular eruption made its appearance on the face, trunk, and upper extremities.

The amygdalitis advanced in spite of a vigorous mercurial treatment, and resulted in suppuration, the abscess pointing at the lower border of the tonsil, between it and the base of the tongue. About the same time there was a marked swelling of the left arytænoid cartilage and the corresponding arytæno-epiglottic fold, which so encroached on the lumen of the larynx as to embarrass respiration.

The mercurial treatment was abandoned, and the patient was given twenty grains of iodide of potassium three times a day; the result was a rapid subsidence of the swelling of the arytænoid cartilage and of the ary-epiglottic fold, and a complete disappearance of the inflammation of the tonsil.

This case is of interest as it illustrates the intensity of the poison, which was sufficient to produce suppuration, which is unusual in amygdalitis due to syphilitic causes.

Case III.—*Congenital Syphilis of the Pharynx and Larynx.*—The family history of this case is instructive. It appears that the mother contracted a chancre on the lip from kissing her lover, whom she afterward discarded for her present husband, who has always been a healthy

man. The chancre was excised, and no secondary cutaneous symptoms made their appearance. She had, however, some throat and bronchial trouble, which was relieved after a course of iodide of potassium. The result of the union was three girls; the eldest, between sixteen and seventeen years of age, has been an invalid for a number of years, bordering on imbecility. The second daughter is fifteen years old and is a fine-looking girl, who has thus far shown no signs of syphilis. The third daughter, the subject of this sketch, is now twelve years of age. When about nine years old she began to show signs of failing health. Both eyes were the seat of interstitial keratitis to such an extent as to cause almost total blindness. She also suffered at this time from deafness and an inflammation of the nose. Under the judicious employment of mercury by her oculist, Dr. Richey, who referred her to me, the opacity of the right cornea cleared up entirely and that of the left is rapidly disappearing. She recently came under my care for a severe sore throat and a persistent cough which prevented her from getting any continuous rest at night. Her condition was then as follows: The expression was one of anxiety, the complexion pale and waxy; the left eye showed slight interstitial keratitis, and the voice was husky. On examination, the nose was found to be filled with a thick muco-purulent secretion, which, when removed, showed a pale, thickened membrane lining its cavities. The teeth were regular and not notched. On inspection of the throat, a small ulceration was observed on the anterior surface of the soft palate, while in the post-nasal space there was a large ulceration extending down to the soft palate, involving the right posterior palatine fold, and which had destroyed the right tonsil. Examination of the larynx revealed an ulceration which had destroyed the right half of the free margin of the epiglottis, and an enlargement of the arytænoid cartilages and ary-epiglottic folds to such an extent that it was impossible to get a view of the interior of the laryngeal cavity.

The patient complained of a constant pain in the region of the larynx, radiating toward the ears, painful deglutition, and an incessant cough with some dyspnœa.

The patient was given an antiseptic wash for the nose and throat and ordered five grains of the iodide of potassium three times a day, and tonic doses of mercury were continued. She began to improve under this form of treatment immediately, and in the course of three weeks the ulcerations in the pharynx and larynx had completely healed, and the swelling of the arytænoid cartilages and the ary-epiglottic folds had subsided so that the interior of the larynx could be seen.

There has been some adhesion between the posterior palatine fold and the pharynx, with the result of narrowing the opening into the post-nasal space. She does not cough and she has gained flesh rapidly.

While congenital syphilis may make its appearance at any time after birth, it is generally not so retarded as in the above case.

J. N. Mackenzie * found, from an investigation that he made of this subject some years ago, that fifty-five per cent. of the cases occurred within the first year, and as many as thirty-three per cent. within the first six months. It occasionally happens, however, that its appearance is delayed until about puberty.

The disease may manifest itself in any form, but its most frequent manifestation is in deep ulceration of the soft palate, from which it extends to the hard palate and post-nasal space, showing a tendency to attack the bones, producing caries and necrosis.

The larynx, although frequently the seat of congenital syphilis, is not so often affected as the soft palate and pharynx, and, in the opinion of Bumstead,† it is always secondary to the pharyngeal lesions, the pharyngeal ulcerations preceding or coexisting with the laryngeal lesion. Mackenzie,‡ on the other hand, believes that the laryngeal lesion occurs much more frequently than is generally supposed, and he states that we may look for an invasion of the larynx in congenital syphilis with as much confidence as in the acquired variety.

Discussion.

Dr. Mulhall: I must say in friendly criticism that the suppuration of the tonsil in the second case narrated by Dr. Bryan might have been coincident with the syphilis, but independent of it. Suppurative amygdalitis, as caused by syphilis, is something new to me. The author has not furnished sufficient proof to establish the fact that the suppurative amygdalitis was caused by the syphilis.

I also desire to say a word about the notched teeth which were absent in the case of hereditary syphilis. I was associated with Mr. Hutchinson for three years as his assistant, and saw many cases of hereditary syphilis. The disease appears to make much greater ravages in the European subject than in the American. Strumous disease and rickets are also much more common over there, due to the defective nutrition of the children. The nutrition of the poorer class of children is much better in this country than it is abroad. I have seen a number of cases of hereditary syphilis here in which the notched teeth were absent. Such teeth are partly the result of the syphilis and partly of the defective nutrition. I do not know how otherwise to explain the relatively much larger proportion of notched teeth in hereditary syphilis as observed abroad than here.

Dr. Wright: I think that very frequently we are too easily deceived by the patient's statements regarding the specific nature of certain lesions.

* *American Journal of the Medical Sciences*, October, 1880.

† *Pathology and Treatment of Venereal Diseases*, Philadelphia, 1879, p. 754.

‡ *Op. cit.*

I know that in one case my credulity has lately received a severe shock—a case of nerve deafness in a young woman. Every possible means was adopted to get a history of syphilis, without result. The patient was one of the most prepossessing and modest appearing of women. Her mother gave an indirect history of syphilis, and the patient improved under the use of potassium iodide. She afterward came under the care of a gentleman of very insinuating ways, and finally admitted to him, in a fit of tears, that she had suffered from some of the symptoms of acquired syphilis after having laid herself open to infection.

I think Dr. Knight will recollect another case in which the microscopical examination and the clinical history all pointed to a sarcoma of the turbinated, and when we were just prepared to remove the maxilla a specific lesion appeared on the shin bone. Late hereditary syphilis is uncertain ground.

Dr. C. H. Knight: In the case referred to by Dr. Wright the diagnosis of sarcoma of the inferior turbinated body was confirmed by the microscope, an examination having been made by several experts independently. The lesion on the crest of the tibia was a periosteal gumma. The intranasal tumor disappeared coincidently with the latter under the influence of large doses of iodide of potassium.

Dr. Mackenzie: Dr. Bryan, in his paper, has referred to some work which I did thirteen years ago on the subject of congenital syphilis of the larynx. I have nothing to add except to say that I then stood alone in the position which I took in the paper; since then, I think, the truth of my propositions has been quite generally conceded. Still, every now and then I meet with adverse criticism of my researches. I wish to say here that it is not in the throat clinics that we find cases of congenital throat syphilis, but in the poor-houses and children's hospitals. My observations were carried on in the great children's hospitals of London, where almost every third case was one of congenital syphilis. In that way I collected one hundred and fifty cases, an analysis of which formed the basis of my paper. I wish to make this statement so that if one meets with adverse criticism of my paper he will understand how my material was obtained and where it was obtained. During my term of service at the London Throat Hospital I do not think I saw over eight or ten cases, but when I went to the Children's Hospital I saw a great many cases daily. I will also state that in my clinic at the Johns Hopkins Hospital I have recently met with quite a number of tertiary lesions of the larynx in hereditary syphilis. Morell Mackenzie once called my attention to the fact of the absence of the characteristic notched teeth in cases in which the throat was involved. I can not say whether that is so or not; I analyzed seven cases after the matter was brought to my attention, and in four of them the notched teeth were absent.

Dr. Bryan: While the criticism made by Dr. Mulhall is very just and may be true, still the patient had been suffering with throat symptoms for several months before he came under my care; they came on in June

and I saw him in October. The lesion did not present any of the other symptoms of suppurating amygdalitis. I would like to ask Dr. Mackenzie whether he still adheres to his former belief that the laryngeal symptoms in these cases are as common as he supposed them to be.

Dr. MACKENZIE: I do.

Paper.

A CASE OF SARCOMA OF THE SOFT PALATE, ILLUSTRATING THE DEGENERATION OF A BENIGN (PAPILLOMA) INTO A MALIGNANT GROWTH. REMOVAL OF THE SOFT PALATE. DEATH.

By W. K. SIMPSON, M. D.

THE possibility of the degeneration of benign into malignant growths is a matter of such intense interest that any data bearing on the subject should be brought to the surface and receive the consideration that their importance demands.

The thorough understanding of this possibility will serve to guard our prognosis in cases seemingly benign, and will guide us in determining to what extent operative procedures may be instituted. Although the subject of this degeneration has received exhaustive treatment quite recently at the hands of Dr. Felix Semon, especially as regards laryngeal neoplasms, and although the conclusions of his investigations are decidedly against the change taking place as often as was supposed, still, that there are unquestioned instances of this degeneration I think there can be no reasonable doubt. Dr. J. Solis-Cohen published one in the proceedings of this society for 1892 under the title of Adeno-sarcoma of the Larynx at the Site of a Papilloma removed Sixteen Years previously.

Without going into any research regarding the literature of the subject, I will simply offer the history of the following case, imperfect, possibly, in some of its details, but extremely convincing and instructive in others.

A further object in presenting this case is to preserve the sequel of its previous publication.

The case was first reported by Dr. G. M. Lefferts at the session of 1889 of this society under the title of Multiple Papillomata of the Velum, illustrated and published in the transactions of that year, a full report of which I herewith append.

"The differential diagnosis in cases so well marked and distinctive as these presents no difficulty. Microscopical signs alone

will suffice for the recognition of their true nature. Although papillomata are the commonest variety of true neoplasms of the fauces, a growth the size of that shown in the present instance must be unusual.

"It occurred in a girl aged sixteen years, who only accidentally noticed its presence in her throat when it had attained one third the dimensions here shown. Thereafter it grew rapidly and in eight months' time resembled the drawing. Little or no inconvenience was caused, dysphagia never being present, and but slight interference with the timbre of the voice. After anæsthesia of the parts by cocaine the multiple tumors that made up the mass were removed by scissors curved on the flat. The uvula was not involved and was left intact. A superficial stellar cicatrix now shows the former site of the sessile portion of the mass. There have been no signs of recurrence."

This report was made three months after operation.

Sixteen months after removal of the original tumor by Dr. Lefferts a reappearance of growths similar to the ones removed occurred, at which time Dr. Lefferts kindly placed the patient in my care for treatment, May 14, 1890. I found several distinct papillomatous masses of various sizes springing from different parts of the soft palate, principally about the free margin, one or two extending down on the left anterior palatine pillar. They were of grayish-red color, freely movable on more or less of a pedicle, and with every physical appearance peculiar to benign papillomata, and, as Dr. Lefferts remarked, absolutely identical with the previous ones he had removed. There was no other evidence of inflammatory changes or thickening of the soft palate, and the seat of the original growth was smooth and free from any attempt at recurrence. Believing, from their appearance and from the previously published record, that they were papillomata, I removed most of the growths by galvano-cautery knife.

From May 14, 1890, to July 26, 1890, I removed several of these growths which made their appearance from time to time, using at times lactic acid in the proportion of from fifty per cent. to full strength and the galvano-cautery, and although at times I removed nearly all of the soft palate, thinking I was completely clear of all morbid tissue, still the cavity left by removal would become most rapidly filled up by a return of the growths, the short space of a week sufficing at times to fill a very large excavation.

Coincidently with the recurrence of these tumors I noticed during this space of ten weeks that the growths were losing their benign appearance and infiltration of the soft palate was taking place. Each recurrence became more dense, and by July 26th the soft palate presented one large inflexible indurated mass. By this time all resemblance to the original type of growth had disappeared, and it was very evident that it was becoming malignant in character, probably a sarcoma. A mi-

croscopical examination made at this time by Dr. George Thatcher, pathologist to the Presbyterian Hospital, revealed such to be the case. The patient complained of no pain whatever, but only a slight difficulty in swallowing and slight thickness of speech. There was no enlargement of the cervical glands. I decided that the most advantageous course to pursue was the removal of the whole soft palate from all its surroundings, and to that end I had the patient transferred to the Presbyterian Hospital, where, on August 2, 1890, Dr. Andrew J. McCosh removed the entire soft palate. It was done very carefully and skillfully by means of the knife and scissors, under cocaine, by spray and hypodermic injection of a four-per-cent. solution. The patient was in sitting posture and the operation consumed about an hour and a half. One drachm (gr. ijss.) of the solution was used by the needle in addition to the spray, and not the slightest untoward symptom occurred, the patient exhibiting a most wonderful fortitude and aiding most materially by her intelligence. There was but slight hæmorrhage, which was easily controlled. After the removal in its entirety it was found to be almost one mass of very dense sarcomatous tissue with a slight adhesion (sarcomatous in nature) between the upper right posterior surface of the soft palate and the pharyngeal wall. This adhesion was thoroughly scraped. The patient made a good immediate recovery from the operation, and for a short time there was no return of the growth, but by October, 1890 (two months after removal), unmistakable signs of recurrence showed themselves, extending up the naso-pharynx, which precluded any idea of further operation. In October, 1890, the patient left the city and passed from under my observation. I learned, however, from the patient's family and attending physician that the growth extended very rapidly up in the naso-pharynx and down the pharynx, interfering with speech to the extent that she had to communicate by writing, and preventing deglutition, and she finally died of inanition April 26, 1891, two years and three months from the first appearance of the apparently benign papilloma and eight months after the final operation.

In Conclusion.—There is possibly one link lacking in the complete chain of evidence in this case, and that is, I understand from Dr. Lefferts that the original tumor was not examined microscopically, but he expresses himself as being positive that there could be no doubt. His description and drawings certainly favor its being a papilloma, and when I saw the first recurrence I could not come to any other conclusion. That a microscopical examination is necessary for an absolute diagnosis I will not deny, but the microscope sometimes misleads or fails to absolutely confirm. Another point for consideration is the effect of the mode of removal of these growths. Though the cautery and lactic acid were effectual in re-

moving them, I can not but think that the reaction from these agents is so great at times as to possibly favor a change to malignancy. That there would have been an extensive recurrence of the original growths there is not much doubt, and if the malignant degeneration could have been foreseen it doubtless would have been delayed by an early removal of the entire soft palate.

Discussion.

Dr. Wright: It is very difficult for me to conceive how such a case as this could be regarded as anything but malignant from the start. The fact that the microscopic examination was wanting seems to me almost a proof that it was malignant. This uncertainty of gross appearances was impressed on my mind during the past winter. A patient was operated on at Roosevelt Hospital for a papilloma of the subglottic space. An external incision was made, and a growth, apparently typical of papilloma, was seen. Dr. Asch, I believe, saw the case, or at least was present at the operation. There was no doubt in any one's mind but that we had to deal with a simple papilloma. A microscopic examination showed it to be an epithelioma, and the larynx was removed at a subsequent operation.

It is very hard, even microscopically, to prove or disprove these cases. You can not tell what there may have been below the papillomatous formation. We know that very frequently in syphilis, tuberculosis, sarcoma, and carcinoma the surface of the growth is covered by a papilloma, and unless you cut deep into the tissues it is impossible to say whether you have to deal with a benign or malignant growth.

The case related by Dr. Simpson ran the ordinary course of a malignant growth from the beginning. It is of course perfectly possible, according to modern pathological laws, that a malignant growth may appear in a benign tumor in the same way as it may appear in normal tissue; and that adds another element of doubt to these cases. It is now thought that a malignant growth is due solely to the potential energy in the cells, which will finally explode itself in the form of infiltration. In other words, a form of cell which does not contain this potential energy does not show this tendency to proliferate. It can not acquire the potential energy if it is wanting from the beginning.

Dr. J. O. Roe, of Rochester: I agree with Dr. Wright that it is impossible to say whether this potential energy is always present or not from the start. I have in one or two instances, however, seen tumors gradually change from a benign to a malignant form, as shown by careful microscopic examinations made at different times. One case was an angeioma of the nose. I removed the growth, which was of quite large size, growing from the outer wall of the meatus. This growth was examined by competent pathologists, who pronounced it an angeioma. It

returned, and I removed it altogether three times. Each time it reappeared there was less vascularity—less of the angeiomatous character—and more sarcomatous elements, which after the third removal were very pronounced. The patient left the city for about two months. On his return only a small portion of the growth had reappeared, and before it had caused any marked obstruction of the nostril the patient died from asthenia. In this case there was an unquestionable transition from a benign to a malignant growth.

Dr. Swain: I have taken occasion in another place to report a case which is in point in the present discussion. The patient was a man, sixty-three years old, who, five or six years before I saw him, became the subject of a tumor in the subglottic space, which was diagnosticated as a simple myxoma. The patient had refused operation and the tumor was allowed to stay there, giving rise to occasional attacks of hoarseness and cough. Latterly these symptoms became more pronounced. An examination revealed a well-marked tumor of the false vocal cord, invading the anterior part of the true vocal cord. The growth was unhesitatingly pronounced an epithelioma; although it had some of the appearances of a papilloma, there was considerable infiltration. The original tumor was still *in situ*. The case seemed a very favorable one for thyrotomy, and the operation was done. The entire mass was removed, together with the original tumor. Sections were made of the original tumor and the epithelioma. The tumor itself was a simple myxoma, with an unusually large number of mucous glands in it; these had begun to undergo degeneration, as we see in a true adenoma of the mammary gland. The epithelioma itself was an absolutely typical one, with the pearls of epithelial cells deeply invading the structures beneath, down to the cartilaginous framework of the larynx.

The man recovered from the operation and died from an intercurrent pneumonia. The interesting point of the case is that the original tumor had existed for at least five years before the malignant growth made its appearance. That the irritation caused by this growth started up the potential energy of the cells producing the epithelioma is at least probable if not almost certain. Another interesting point is the fact that in the original growth itself the glandular tissue was undergoing this transformation from the appearance of a true adenoma to that of an epithelioma.

Dr. Glasgow: The subject of benign growths becoming malignant is an interesting one. In the case reported by Dr. Simpson, the weak point is the lack of a microscopical examination of the original growth. Semon has gone very thoroughly into this subject, and from his statistics it appears that this change occurs very rarely. From those statistics I have made up my mind, somewhat unwillingly, that such a transformation is barely possible. Such changes, however, take place externally, and I do not see why they should not take place in the larynx. A case has come under my observation that I considered originally to be a benign

growth—a papilloma—and subsequently it seemed to change to a malignant growth; however, one important element in the case, the microscopical examination, was wanting. It occurred early in the seventies, and was a case of large multiple papillomata, nearly filling the larynx. I removed the larger part, but left a portion of the base. About a year after the operation he came to see me. He was suffering great dyspnœa, and on examination it was found that the growths had reappeared and completely filled the larynx. I was just about to leave for my summer holidays, and I told him that I would not be able to perform a thorough operation at that time, but would simply relieve his dyspnœa, which I did by clearing out a large portion of the growths. I noticed then that this new growth had an entirely different appearance from the old one. The original growth had the ordinary pink hue of the papilloma, while this was very white. It had grown very rapidly, and taking this fact into consideration, and its changed appearance, as well as the man's cachectic look, I was inclined to believe that this new growth was malignant. The man died six months later.

If it can be proved that a benign growth may be changed to a malignant one by operative interference, it has a very important bearing on these operations, as in many cases removal of these growths is not absolutely demanded, as they simply cause inconvenience or some change in the voice.

Dr. F. I. Knight: This is the topic on which I asked for some information yesterday. I think that the testimony of the individual members here will be worth a great deal more to us than years of theorizing and microscopical work. As I said yesterday, I have never encountered but one case of tumor of the larynx wherein a growth which I had diagnosticated as a simple papilloma proved to be malignant later. That case very probably was malignant from the beginning. It was a case of multiple papillomata, as was Dr. Simpson's. I should consider in his case that the probabilities are in favor of the growth having been malignant from the start.

In regard to the value of a microscopic examination of these bits of tissue which we remove from the larynx, if we get any positive evidence thereby, well and good, but I do not think the negative evidence is worth anything. I feel that I can judge better by the clinical aspect of the case, by its appearance, and by the changes which take place, than I can from the microscopic examination, and I should like to have the opinion of the members on that point; also let each one put on record to-day any case that has come under his observation in which a supposed benign growth became malignant.

Dr. Clinton Wagner, of New York: In regard to the degeneration of a benign into a malignant growth, I wish to give an instance which came under my observation. The patient, a man, some years ago came to my clinic at the Metropolitan Throat Hospital. At that time there was a growth about the size of a large pea on the right cord, near the anterior

commissure. I regarded it as a papilloma, and suggested the removal by the forceps, which could have been done at that time without difficulty. The patient declined operation and sought treatment elsewhere.

Twelve months later he again consulted me, at which time the whole box of the larynx was almost completely filled with growth. Several large pieces were removed by means of the forceps, but as the growth was found to extend downward below the cricoid cartilage, and as dyspnœa was becoming more urgent each day, tracheotomy and thyrotomy were performed, the growth removed, and the patient discharged in a few weeks from the hospital. The tumor was submitted to Dr. Heitzmann for examination, who pronounced it a simple papilloma which had grown from a highly inflamed base, and, if it recurred, it would most likely come as a malignant growth. Both the curette and galvanocautery were employed to secure thorough destruction of the attachments of the growth. Several months later the growth reappeared on the very same spot; it grew very rapidly. A portion of the tumor which was submitted to Dr. Heitzmann for microscopic examination was pronounced to be epithelioma. I resected the entire right half of the larynx. The man died fifteen days after the operation.

In another case—a sessile growth upon the right cord, the greater portion of which I removed—the patient, feeling so much improved, disappeared from observation; he returned for further treatment six months later. The growth filled the larynx almost completely. Tracheotomy and thyrotomy were performed, and the mass thoroughly removed. One microscopist pronounced the growth a simple papilloma, another a sarcoma, while still another an epithelioma papilloma. My own idea was that it began as a papilloma, but recurred as an epithelioma.

Dr. F. I. Knight: I think, in the first case reported by Dr. Wagner, the pathologist was probably wrong. A malignant growth developed in seventeen weeks at the site of operation, which shows that it was probably malignant at the time of first removal, or, at any rate, one would hesitate to accept it as a benign growth at that time.

Dr. Wright: It seems to me that the clinicians have entirely too much respect for the microscopist, and that the microscopist has entirely too much contempt for the clinicians. One is as liable to make mistakes as the other. The microscopist makes a number of sections from a growth, but it is impossible to say whether we have not left behind the cells which in the future will produce a malignant growth apparent even to the naked eye. We must go back and change the conception we have of the present laws of pathology. We must learn something more about the laws of biological growth. It can not be settled by bringing up this case and that case, because the question will always arise whether we have not left behind the malignant part of the growth, or whether the part of the mass selected for examination contained the characteristic evidences of its nature. Without a microscopic examination at the first,

of course we, as clinical diagnosticians, lay ourselves open to justifiable criticism.

Dr. Swain: I do not see why Dr. Knight takes exception to the case narrated by Dr. Wagner. If that growth was malignant from the start, why was not the entire growth malignant? Is it possible for the base of a growth to be malignant, and its outermost or oldest portion to be non-malignant? I think not. We must look upon the portion of the growth that is uppermost as its oldest portion. That is a fair inference. If this portion of the growth was diagnosticated as papillomatous, why was not the original growth a papilloma which had undergone this degeneration the occurrence of which we are discussing? A papilloma is a fairly easy growth to diagnosticate in one way. It has a certain characteristic appearance which a sarcoma or epithelioma has not, and if the upper portion of the growth in Dr. Wagner's case was pronounced by a skilled microscopist as being a papilloma on an inflamed base, I should like to know why that is not just exactly what we might have. Perhaps through the prolonged irritation of the base by the papilloma the epithelioma was developed.

Certainly, as Dr. Wright says, the general laws of pathology are still unsettled; but if there is any truth whatever in the Cohnheim theory of the potential energy springing out of the original embryological elements, I think just such a case as Dr. Wagner relates is one in point, and I do not think it should be ruled out on the ground that the pathologist made an error.

Dr. Wright: In speaking of the malignant growths, I think we must rule out microscopical evidence of small-celled sarcoma. Under the microscope it is easy enough to recognize the spindle-celled or giant-celled sarcoma, but with the small-celled variety the clinical appearances are much more reliable than the microscopic. In the case of a small-celled sarcoma you will get all sorts of diagnoses from the microscopists. Without the history it is impossible to get two men to agree. Small, round-celled sarcoma, granulation tissue (syphilitic or tubercular), and lymphoid hypertrophy are frequently indistinguishable under the microscope.

Dr. Mulhall: I desire to ask a question on a subject about which I must confess a certain amount of ignorance. Is sarcoma of the upper air passages ever operable? In other words, is it justifiable to operate on sarcoma of the upper air passages? Does any one know of a case in which recurrence and death have not followed? If, perhaps, we saw these cases early enough, recurrence might be prevented, but, unfortunately, we do not see them usually until hæmorrhage and obstruction have taken place.

I would suggest as an excellent subject for a paper to one who has access to the literature the following: "Is sarcoma of the upper air passages ever operable, in the light of past experience?"

Dr. Farlow: Several years ago I removed with the snare an out-

growth from the left side of the anterior part of the septum. The growth was pronounced by the pathologist a fibro-sarcoma. The operation was performed four years ago, and no recurrence has taken place, either on that spot or elsewhere.

Dr. Robinson: I know of one case of sarcoma which has gone on for three or four years after operation without signs of recurrence. The operation was performed by Dr. Bull. The man resides in Newport and is occasionally under my observation.

Dr. Gleitsmann: I exhibited a case of primary sarcoma of the tonsil to the members of the Section in Laryngology of the Academy, showing the patient both before and after operation. The operation was performed two years ago, and thus far there has been no recurrence. He came to my clinic at the German Dispensary presenting a growth of the tonsil, which was pronounced by Dr. Heitzmann to be a sarcoma. The patient was referred to the surgeon of the German Hospital, who performed tracheotomy, cleaned out the triangular space, and excised a part of the lower maxilla and the tonsil. In addition to that he found that the larger part of the tongue was also infiltrated, and removed it almost entirely, leaving only the tip. The patient is able to make himself understood by whispering.

Dr. de Roaldes: As a newly elected member, I had not intended taking a part in the discussions of this meeting, but I feel it my duty to report in this connection a case which has occurred in my own family, and which illustrates very well a point made by Dr. Wright in regard to the difficulty of diagnosticating with the microscope sarcomatous growths when they affect adenoid or lymphoid organs like the tonsil.

In my own house, some years ago, I had occasion to remove a tonsil which I considered at the time to be a fibroid tonsil and which caused a great deal of trouble. It had been treated previously by several family physicians, and for years repeatedly touched with caustics. I operated the case in my office; there was no hæmorrhage whatsoever, and I sent the lady home and gave the matter no further thought, when, an hour after, I was hurriedly summoned and found that I had to deal with one of the most frightful cases of post-operative hæmorrhage I have ever seen. The lady had taken some warm milk; this, I presume, favored the hæmorrhage by dissolving the clot. Anæmia of the brain, convulsions, and other very severe symptoms were the result of this great loss of blood. I had kept the removed tonsil, and sent a portion of it to the late Dr. H. D. Schmidt, pathologist of the Charity Hospital, who was then considered one of our best microscopists. His report came in a few days later, in which he pronounced the growth a round-cell sarcoma. This report, which took me by surprise, worried me very much, and about three weeks later I sailed for England and had the lady examined by two or three well-known men. Nothing suspicious could be found from a clinical standpoint. I then went to Paris and had the specimen carefully

examined in Dr. Cornil and Dr. Ranvier's laboratory. There also it was pronounced to be a round-cell sarcoma.

The tonsil was removed six years ago: since then I have watched the case attentively, and there has been no sign of recurrence.

I to day report this observation simply to show how difficult it is to base one's diagnosis of such cases on the microscopical examination. Supposing in my case that, influenced by the microscopical reports, I had hastened to remove the whole tonsil by a subsequent operation, I should be able to report to-day to you a case of sarcoma of the tonsil successfully operated, and in which six years after no recurrence had taken place.

In conclusion, I think we should be very prudent in such cases and not trust too implicitly the microscope when it comes to diagnosticate suspected sarcomatous growths in adenoid or lymphoid organs like the tonsils.

While I use the microscope in my own hospital—and I have made the microscopical department a feature of the institution—and while I insist that, as far as possible, no growth should be removed before hearing from our pathologist, still I have learned by experience, as some other observers have recently pointed out, that the microscope is apt to lead to some very serious errors of diagnosis in cases as above referred to.

Dr. Shurly: I can confirm what has been said about the dangers of relying too much on the report of the pathologist. I do not know of a single case in my own practice in which a benign growth has become malignant. I can conceive, however, theoretically, of such a degeneration or evolution occurring. It is a very short step from the homogeneous to the heterogeneous formation. I believe general surgeons are almost all agreed that a benign growth of the mammary gland may become malignant. Until we learn the true pathology of these growths I do not see how the question can be settled. Very many people in this country, no doubt, live for many years with a papillomatous growth in the larynx and never come under special medical observation. I have frequently found them in persons whom I examined at my own solicitation. We do not know how often malignant growths may have been preceded by benign growths, because we have no accurate statistics on this point.

Dr. Simpson: The lack of a microscopic examination of the original growth in my case is possibly a weak point. My idea was to invoke a discussion on this subject. The discussion has really convinced me that my weak point is not quite as weak as at first supposed. If clinical evidence is of any value whatsoever, the original growth was undoubtedly a papilloma. I do not think we should criticise the microscopists or the microscope, and to a certain extent we must accept their statements.

One important point in connection with this subject is the matter of irritation. It is maintained by many that irritation is primarily the cause of malignant growths. When we operate on a laryngeal growth, appar-

ently benign, it is almost impossible to avoid irritating or wounding the surrounding tissue, and this, I think, forms a focus for future degenerative changes. In the case reported by me the potent factors of irritation were the cautery and the lactic acid. You could almost see these benign growths become indurated and change their appearance.

Paper.

PROPHYLAXIS AND TREATMENT OF DIPHTHERIA.

By BEVERLEY ROBINSON, M. D.

(A) *Prophylaxis.*—At our last meeting, after the debate which followed the reading of my paper on Membranous Sore Throat, it was resolved that a thorough discussion should take place at this meeting in regard to the best means to adopt in order to prevent the extension of diphtheria, especially in towns and cities. This, as we all know, is a most important and also a very difficult problem to settle in anything like a satisfactory and thorough manner. The best that *I* can hope to do is again to bring the matter before the attention of this association, and in connection therewith to state some well-recognized facts with their seeming practical deductions, and finally lay hold of some general—if not always specific—rules of guidance, which shall be of great use to us as practitioners and to the public, who may lend a willing ear to our affirmations. In this way we shall finally obtain entire municipal control of all those conditions which breed diphtheria.

What I shall have to say will have to do mainly with questions of (1) causation, (2) isolation, (3) disinfection. How is diphtheria caused? For many to-day there is the specific germ of diphtheria, the so-called Klebs-Loeffler bacillus, which is found almost invariably in the exudate of the disease, and is regarded as its distinct, *efficient cause*. It is also true, for those who admit this fact, that this bacillus secretes a poison which penetrates the blood and the tissues, and through them produces all those secondary effects which are the proofs of systemic infection.* On the other hand, we find evidences of diphtheria taking place in a most virulent form, repeated epidemics occurring, indeed, when no such primary cause was re-

* It is now proved that the bacillus of diphtheria is able to penetrate "the circulation and the internal organs" (see Case of Diphtheria of the Heart, *Medical Record*, p. 631, May 20, 1893, also *Johns Hopkins Hospital Bulletin* for April, 1893).

vealed, at least if this primary cause—or diphtheria bacillus—takes its origin, as is now often assumed, from a previous case from which contagion, either directly or indirectly, is carried. Diphtheria has arisen in small villages, in isolated farmhouses, in palatial country dwellings, where no case of this disease had previously been known to exist. We must admit, therefore, that ill-ventilated areas or rooms where dampness and dirt are present, where mold fungi appear upon the walls, that cellars which are wet and contain decaying vegetable or animal matter, are quite sufficient at times to bring this poison into active existence. In the admission of almost all observers, filthy privies and cesspools, broken and clogged drains, water-closets and pipes emitting sewer gas, are also causes for the outbreak of an epidemic which is with difficulty arrested. Whenever the milk or the water supply has in any way become contaminated by sewage or filth from different sources, we again have an ætiology of this disease which we are willing to admit. To prevent, therefore, all these causes of disease, to stop a development and spread from them, means, of course, to see that our pipes and drains are intact, that no sewer gas from infected sewers may gain entrance into our houses; that our cellars are kept dry, clean, and well ventilated; that there are no floors near the earth with damp spaces shut in between them, which never receive a free current of air; that our closets and rooms everywhere in our homes are frequently cleaned and ventilated.

Whenever a case of diphtheria actually occurs, what we must immediately do with it is to give the patient the best possible isolation. Before, however, isolation is even attempted let us be sure, as nearly as we can be, that we have to do with a case of diphtheria. For this purpose I claim that it is now the duty of the practitioner in every case of doubtful membranous sore throat to swab the fauces with a sterilized cotton-wrapped stick, and to have the exudate taken from the throat submitted immediately to bacteriological examination. As soon as this is done, and while awaiting the report of this investigation, the patient should be put in a room by himself, as far removed as possible from other members of the household, and preferably on the top floor of the house. Before he is placed in this room everything should be removed from it except articles strictly necessary to the well-being of the patient and his nurse. The air of the room should be changed very often, due regard being always had to outside temperature and to avoidance of draughts. Of course, if there is an open fireplace in the room, it can be ventilated easily

and effectively, even though the windows are only partially opened. In the dilution and change of air, we have the best of all disinfectants for a sick-room with a contagious disease present like diphtheria.

The food required by the patient should be brought to the door of the room and carried in by the nurse. No one should see the patient except the nurse and the physician.

All discharges from the patient's mouth or nose should be received upon cloths, which should be immediately burned. The excreta from the bowels and bladder should be properly disinfected with solution of copperas, bichloride of mercury, or carbolic acid, sufficiently concentrated to be really effective. These rules may all be carried out usually in the dwellings of the rich with very little annoyance, trouble, or expense. They may be made far less rigid or stopped altogether if at the expiration of twenty-four hours the bac teriological researches have proved negative. If, on the contrary, these investigations corroborate the opinion that the case is one of diphtheria, they must be insisted upon during the entire duration of the disease. While the rules above laid down are relatively easy of accomplishment in the houses of the wealthy, can they be rigidly enforced in hotels, boarding houses, and, still worse, among the crowded tenements of our large cities? The answer is that they can not, and that even in our attempt to carry them out we shall cause very great trouble, sorrow, and expense which can not be easily met. It therefore behooves us more urgently still in these latter instances to be sure of *our diagnosis* before effective isolation is seriously attempted.

As I have stated above, I know of only one way to strengthen an uncertain diagnosis, and it is by appealing as soon as possible to the expert bacteriologist and obtaining the results of his research. Meanwhile we must imitate, as far as is practicable, the conduct outlined where the conditions are unusually favorable for complete isolation. Whenever the case assumes the undoubted character of true diphtheria, and is therefore of malignant nature—unless the isolation can be made effective in the home—the patient should be carried to a place where this isolation can be had. In my judgment the only way to accomplish this is to have in different sections of our towns and cities one or more isolating hospitals or pavilions, which should be entirely separate from or exist as annexes of our large city hospitals, where diphtheria patients would be taken and intelligently cared for. This is still one of the long-felt needs of this

large city, and indeed of most of our cities and towns. Not, indeed, that it has not been met in a certain measure here with us, as witness our Willard Parker Hospital, located in East Sixteenth Street. But a great many more of a similar kind are required, and not for the very poor only, but for the numbers of people in moderate circumstances living in hotels and boarding houses, who, when taken ill with diphtheria, can not be treated properly, and who are a menace to many well persons in their vicinity, who must remain where they are, unless places were provided where they "could be sent until recovery and disinfection at home have been completed" * (Jacobi). Let us hope that those who are powerful to work changes in regard to this condition of things will see the great wisdom of so doing. First, let our appeal be made to our legislators, to our boards of health; next, to the charitably disposed, who have already given us orthopædic hospitals, hospitals for cancer and skin diseases, hospitals for consumptives, homes for the aged, the blind, the deaf and dumb, but none for those stricken down suddenly and most grievously with diphtheria, not to speak of scarlet fever, measles, and small-pox.

In regard to funerals and schools, much might be added. It is evident to all thoughtful persons that funerals of contagious diseases should be strictly private, and not only should the family and friends desire it and carry their wishes into effect, and thus prevent all danger of contagion arising from the presence of afflicted ones in the house or chamber where the deceased is, but the law should assert itself for the public good. The regulations governing funerals of those who have died of diphtheria should be distinct and formal, and a sanitary officer should always be present to see that there is no infringement of them by reason of ignorance or neglect.

In regard to the subject of funerals in New York city, it is only proper to add that the latest edition of the Sanitary Code of the Board of Health provides, in section 204, for the proper regulation of them in cases of contagious disorders. In the latter section it makes it the duty of the undertaker to notify the health department of such cases whenever he encounters them, and forbids him to assist in the public or church funeral of any person who has died of

* In the debate upon Dr. H. M. Biggs's paper before the New York Academy of Medicine, May 18, 1893, entitled The Organization and Equipment of the Division of Disinfection, New York Health Department, and the Method of Work, this matter was considered and its importance emphasized by Dr. J. D. Bryant, Dr. A. Jacobi, and Dr. Beverley Robinson.

a contagious disease. To what extent the ruling of this section is adhered to, *I* can not say. I am told, however, by my friend Dr. Alvah H. Doty, the present head of the bureau of contagious diseases, that the law is strictly observed in every instance.

In regard to schools, it is clear that no child from a house in which there is a case of diphtheria should be admitted to a school until all danger of contagion is over. The precise time during which such absence should be enforced may be a little doubtful, but it is a safe rule to make that a return to school should not be permitted for one month at least from the time of the inception of the disease. In this connection Jacobi writes (*On the Treatment of Diphtheria in America*, Berlin, 1891, p. 5): "In all large communities the cases of diphtheria are reported immediately for the action of the health board. One of its functions is to protect the schools by communicating with the board of education. The children of a family, or those living on the same floor, where a case of diphtheria has broken out, are kept away from the schools until all danger has been averted. The schools have often been closed when an epidemic made its appearance and threatened to prove dangerous." In the light of present knowledge, however, a physician can not conscientiously give a certificate such as school boards generally exact without a bacteriological examination. "The only safe way is for school boards to insist in every case upon the applicant for readmission bringing a certificate from the local health authorities that the requirements of the law have been fulfilled, and that it is safe to return to school. Competent health officers should be appointed not only to supervise isolation and disinfection, but also to make or obtain bacteriological examinations when required, inspect schools in time of epidemic, and grant certificates for the readmission of convalescent scholars." (*System of Practical Therapeutics*, Hare, vol. ii, p. 517.)

Section 169 of the Sanitary Code of New York city, however, is the only one which refers to the matter of protection of schools against the invasion of contagious diseases. Moreover, it does so in very general terms and not in such a way as to govern precisely the action of parents and teachers in this important matter. I would therefore suggest that a section be added which will be at once clear and comprehensive, and thus commend itself to the intelligence and conscience of every citizen. This additional section is scientifically supported by the observations of Roux and Yersin, that the bacillus of diphtheria may be found in the pharynx of persons that have suffered from the disease as long as five weeks after the disappearance

of the membrane. As a result of this observation, confirmed by the investigation of other authorities, the conclusion seems warranted that most cases of diphtheria, when dismissed from treatment, still possess the capability of transmitting the disease. "While the likelihood of spreading diphtheria after convalescence from the disease is not great, the practical lesson taught is that the greatest care should be exercised during this period; that the cases be not permitted to mingle too soon with other persons; and that for a long time after the disappearance of the membrane and of all the symptoms of the disease, the patient be instructed to continue the employment of antiseptic gargles." (*Medical News*, December 3, 1892, p. 642.)

During the entire period that diphtheria exists in a dwelling and until the whole of it, or the infected rooms of the house, have been thoroughly disinfected, the people living there should be carefully watched. How many cases of diphtheria are carried by children from such a house to others with whom they play daily or into whose houses they are allowed to enter! How many tailors, dressmakers, washerwomen, scrubwomen from such houses are allowed to send their infected clothing or go themselves to other houses where contagious disease has not entered previously and bring it with them in all its virulence! Should there not be proper and legal control of all these people, so that by a judicious system of enforced isolation they would be prevented from carrying disease and death among many who may become victims of their conduct? As to the physicians themselves, I would make it obligatory upon the physician who attends the case to pull a blouse and overalls over his coat and trousers on every occasion before he entered the room of the patient. These garments should be left at the door of the room and placed in a bag properly disinfected from time to time during the course of the disease; or, indeed, fresh clothing of this kind should be provided for the physician at every visit, and when once used should be thrown into a boiling disinfectant solution. The blouse might have a hood which should go over the physician's head as an additional safeguard to others. Another suggestion, perhaps even better, is that the physician in attendance wear an antiseptic gown, also with a hood, reaching to his ankles, somewhat after the pattern of those now worn in some of our surgical clinics. These gowns are made of bleached drilling or pure linen, and usually loosely fitting, so that they can be put on or taken off easily. This idea would appear to have been carried out already in a practical

way in the new isolating ward "for doubtfuls" at the Trousseau Hospital, Paris, France, which has proved a great success. "At the usual entrance of the hospital is a vestibule for blouses, which are invariably worn by all who participate in the visit, and are dropped upon the floor of another small room before leaving the building." (*Boston Medical and Surgical Journal*, April 27, 1893, p. 412.)

It is also now the custom to wear gowns in the diphtheria wards at the Willard Parker Hospital in New York city. The doctor should wash his face and hands in a mild disinfecting solution, preferably of boric or carbolic acid, whenever he leaves the sick-room. All these precautions seem useful and indeed imperative. The only objection to their being fully carried out is the effect which they might have on the community in one particular. They would make people, at first, even more timorous than they now are in regard to the transport of contagious disorders. On the other hand, in the course of time, and indeed rapidly, would not these fears be greatly lessened owing to a feeling of far greater security in regard to themselves and those they love? Every one would surely understand that all judicious and necessary precautions had been taken to limit the risks of contagion, and soon, as virulent disease like diphtheria became less frequent, each person would cease to dread it so much, merely because he would rarely have occasion to hear about it at all.

The question of disinfection may now properly claim our attention for a little while. As to disinfection of the sick-room during the time the patient is there, it may well be asked if it is desirable to attempt it, and to what extent. I presume it can be safely answered that anything like complete, satisfactory disinfection is wholly impossible without doing the patient positive great injury, and rendering the room unbearable also for the nurse in attendance. I have no objection to, and indeed should rather indorse, the employment of certain mild disinfecting vapors, which possibly make the diphtheritic germs less active, so far as the patient himself is concerned, and render it less probable that they will do harm to others, if they are carried upon the person of the physician, or in some article of clothing, furniture, bedding, crockery, etc., which has been taken from the room prior to the cure of the patient, or the complete disinfection of all his surroundings. Of course the use of such a disinfectant should not, in any sense, interfere with the immersion in boiling water with carbonate of sodium (℥ j–Oj) of all such articles as can be thus immersed, without injury to them,

prior to their being removed from the room. Of the disinfecting agents to be thus usefully employed, I have no hesitancy in recommending those, in the first place, which can be volatilized readily, and which will thus be able to penetrate every nook and corner of the room, and, in addition, are likely to be useful to the patient when directly inhaled by him, and be brought in contact with diseased surfaces. Further, such agents need not be too unpleasant for the nurse and physician, and may perhaps make them more impervious to contracting diphtheria themselves, and less liable to aid, or cause, its spread outside the sick-room. The more volatile agents, which are frequently placed in saucers around the sick-room, sprinkled over the bed linen, hung in saturated cloths on either side of the door opening into the hall, or into an adjoining room, although probably unobjectionable, have far less real utility in my judgment. In this list we may place such well-known agents as chloride of lime or permanganate of potassium in solution. Among the volatile agents which seem most satisfactory, and which have, according to some good observers, given valuable results, we may properly include substances like eucalyptus, turpentine, carbolic acid, creasote, and tar. Either one of these agents may be added to a can containing boiling water, and this water may be kept simmering most of the time near the bed of the patient. These agents should not generally be employed in strong enough proportions to occasion any additional local irritation of the respiratory tract. They should simply be added to the water in sufficient quantity to correct at the time the evident catarrhal element which is often so prominent a feature in the rise and development of very many cases of diphtheria. Sometimes one of the agents may be used alone, sometimes various agents may be combined in a similar or different proportion, and the combined drugs may be added to the steaming water. Dr. J. Lewis Smith has found a combination of the following kind to be very useful in his own practice and that of others, and cordially recommends it to those physicians who have charge of cases of diphtheria. It consists of an ounce each of oil of eucalyptus and carbolic acid,* and eight ounces of turpentine. Of this mixture two tablespoonfuls are added to the water contained in a wide pan whose contents are about one quart.

* Instead of carbolic acid, I would prefer creasote in this formula, as being less liable to cause injurious or poisonous symptoms from continuous absorption through inhalation. Indeed, it may be prudent for various reasons to interrupt the inhalations occasionally.

In stronger proportions of carbolic acid and eucalyptus this vapor has proved irritating and offensive to some patients. If such a vapor as this is really useful, I can readily believe that it would be well to adopt it for the complete disinfection of many places in which such remedies should, from time to time, be employed, even though there be not invariably the confirmed proof that a true case of diphtheria has been present at the spot. In such category I would include all public places where large numbers of people congregate, or are continually remaining for a while, and then going elsewhere. All schoolrooms, public halls, theaters and other places of amusement, public vehicles, cars, and perhaps churches, should be subjected, at times, to this kind of local disinfection. Are such vapors more, or less, useful than the well-known sulphur fumigations, which are always resorted to in our city disinfections after the patient has completely convalesced?* I am not authorized to say, and I am not conversant with any experiments which demonstrate clearly their usefulness or their practical inutility. What I do know is this—and this was referred to last year by me at our regular annual meeting in Boston—that sulphur fumigations as carried out by our health authorities are frequently ineffective and highly objectionable. I have alluded already in my previous paper to many of these objections. I would again refer to one which appears to me very important, and which has not, I believe, been often mentioned, and it is that the active member of the disinfecting apparatus is never thoroughly disinfected himself; and it seems to me that he must necessarily be the direct carrier of many more infective germs than he gets rid of by burning a few pounds of sulphur in a closed room. It is evident that this person can not remain in the room long enough to be properly disinfected, even presuming that sulphur vapors would disinfect the outer man. It is certain that this agent, representative at the health board, can not take even a whiff of sulphurous vapor without occasioning himself harassing cough and sensations of suffocation. The vapor referred to above, equally disinfecting with that of sulphur, doubtless can be inhaled, for a while at least, in tolerably concentrated form without causing positive injury, and for this reason alone is preferable: and if the man sent around to different houses by the health authorities would surround

* It has been shown lately that fumigations with burning sulphur ($= SO_2$) must be rendered *extremely moist* in order to be at all effective, otherwise they are relatively inert. Biggs (H. M.) before the New York Academy of Medicine, May 18, 1893.

himself for a short time even with such vapors, he would probably become less dangerous as a direct carrier of infective disease. A point that can not be too strongly insisted upon in every way, not merely for the patient himself, but for the nurse, the physician, and indeed all persons who in any way have been exposed to the contagion of diphtheria, is the frequent use of mildly detergent and antiseptic gargles, such as those of carbolic acid with borax and water, or of thymol, menthol, wintergreen, combined with more or less saturated solutions of boric acid; or of very mild solutions (1 to 10,000) of bichloride of mercury. By these means I am confident the limitation to the spread of diphtheria will be surely effected. Nothing, we must admit, is more clearly and definitely established to-day than the fact that frequent local disinfection of the mouth, fauces, and pharynx even with very mild agents of this order is most important in diminishing the local extension of the diphtheria exudate, and in this manner lessening the deleterious general effects of the poison secreted by the bacillus, which becomes so rapidly absorbed, and extends throughout the organism in every part.

Again, it is well in time of epidemic to be particularly careful in regard to the management of all throat ailments, even slight in character, and particularly among young children. I would strongly advise, under these circumstances, frequent gargling with one of the combinations mentioned above, and as additional security I believe a throat inspection should be made daily of all scholars in our public schools, of all children in our homes, by some one competent to discover the first symptoms of local infection with diphtheria. Of course, this obligation becomes still more urgent whenever a child or adult, no matter where found or in what capacity, complains of symptoms of general malaise, allied or not with local symptoms or signs of implication of the throat in acute disease.*

(B) *Treatment of Diphtheria.*—Despite the advances made during the past few years in our knowledge of the pathogeny of diphtheria, as is shown especially in bacteriological investigations of this disease, the treatment of it is still uncertain and unsatisfactory. The really bad, malignant cases frequently progress inevitably to a fatal termination, and in some of them it is doubtful if any treatment thus far tried will arrest their march for a while, or ultimately

* In view of the results of Feer's study (*Medical News*, May 20, 1893, p. 552) it would appear evident that "virulent diphtheria bacilli may be found upon the tonsils in the total absence of deposit." The practical outcome of this observation "leads to the treatment of doubtful cases in times of epidemic."

cure them. Such appears to be the testimony of some excellent observers of wide experience. These fatal cases doubtless become so by reason of the toxic character of the epidemic, and the extreme susceptibility of some patients to the virulent poison of the disease. It is generally admitted, however, that those patients continue to react most favorably who are actively and judiciously treated from the inception of the disease. The mode of treatment seems to vary considerably with different observers. There is, however, a tolerably large and increasing number of eminent practitioners who evidently consider proper local treatment of the highest importance. Of these, many use drugs internally with the conviction of being helpful to the patients.

Among them I would especially cite Jacobi, who thus speaks of the use of the bichloride of mercury when it is given internally: "That its beneficial effect is not at all limited to the cases of laryngeal stenosis, but also those of sepsis. Indeed, in a great many such cases it has been administered and found effective" (*loc. cit.*, p. 17). On the other hand, Osler writes (*Practice of Medicine*, p. 109) that "we are still without a remedy capable of combating in any way the effects of the poisonous toxalbumins." I can not say that I have seen from the bichloride of mercury "the specially good effects which many writers describe." The latest report, moreover, of one of the large German hospitals is to the effect that no internal treatment was employed, and the results obtained with severe cases of diphtheria have been quite favorable as compared with numerous antecedent or contemporaneous results accomplished elsewhere. The report just referred to is that of the Friedrichshain Hospital in Berlin, where it is stated that "during the last two years no drug treatment was instituted," and yet there were sixty four per cent. cures (*Journal of Laryngology*, March, 1893, p. 124). This experience is also corroborated by that at the Willard Parker Hospital, where, according to Dr. William H. Park (*Medical Record*, July 30, 1892, p. 117) "the only constitutional treatment is to give alcoholic stimulants throughout the course of the disease to those showing any tendency to heart failure." The great difficulty in obtaining the best effects of local treatment is due to our inability to reach directly all the parts involved with topical applications. Ordinarily it is believed that these applications should be of distinctively antiseptic nature. In regard to the particular drug employed, the strength, manner, and frequency of its use, there are great differences of opinion. Of course, the manner in which

treatment is conducted must differ somewhat with adults and children, the latter being less amenable to reason and less willing, therefore, to submit quietly to the necessary manipulations for the cure of the disease. Most observers are united in the belief that our main efforts should be directed toward destroying or lessening the vitality of the bacilli, diminishing the local spread of the disease, neutralizing the toxic results of absorption of the poisons produced by the bacilli, and support of the patient's strength with food and alcoholic stimulants. Inasmuch as the majority of cases of diphtheria occur among children, we must first consider how such cases may best be treated. This will depend upon whether the disease affects the nose, the pharynx, the larynx, or all these organs. If it attacks the pharynx, and as soon as we have the first local evidence of this implantation, mild cleansing, disinfectant solutions should frequently be employed. Depending upon the age of the child and its degree of weakness or strength, the throat must be treated with sprays, with irrigation, or with gargles. Sometimes one, sometimes the other method is most successful, according to the age and willingness of the little patient. In this connection, I wish to emphasize the fact that in my experience it is more useful and satisfactory to disinfect and cleanse the throat by means of sprays, employed not directly through the mouth but indirectly through the nose. In this manner nearly every portion of the diseased membrane is brought into more complete contact with the medicated solution than in any other way, and with less distress and fatigue to the sick child. Whenever the spray fills the nasal passages, it will almost inevitably, in the large number of instances, reach almost the entire naso-pharynx, the middle pharynx, and portions at least of the fauces and tonsils. Through efforts of gagging or choking by the patient, the latter parts are surely cleansed and disinfected. Nasal sprays, in my judgment, should be rather coarse, never very strong, and be repeated every hour or two. The frequency of their use should depend somewhat upon the malignancy of the case, the thoroughness with which they are employed, and the time of day or night. In general, I am glad to say that I am in accord, in this opinion, with Dr. C. A. Siegfried—who writes: "In the very young, sprays can be introduced through the nostrils to the back of the throat" (*Medical Record*, November 26, 1892)—and the treatment of the Willard Parker Hospital, where "all patients have their nostrils syringed with a bichloride solution." Dr. A. Jacobi also states, with his very large experience to guide him, as follows: "Gentle nasal injections

reach the important part of the pharynx better than injections in the oral cavity." (*On the Treatment of Diphtheria in America*, p. 11.) "Nasal injections must be made early, frequently, and persistently." In speaking of nasal and naso-pharyngeal diphtheria infection, Dr. Jacobi affirms emphatically that "nasal injections alone are beneficial, and sometimes so to a remarkable degree" (p. 13). Immediately after the use of the spray a strong disinfecting solution should be applied directly to the diphtheritic patches in the throat by means of a swab or brush. The sprays for the nose must be preferably made from mild solutions of carbolic acid with lime water, borax, or bicarbonate of sodium, or else from very dilute solutions of bichloride of mercury. The solutions of carbolic acid should not be stronger than one or two per cent.; those of mercury, one to 4,000, 8,000, or 10,000.

In this connection I would mention that the *résumé* of the collective investigation of the *Therapeutic Gazette* (1883) is not favorable to the use of carbolic acid. It is regarded as a useless and positively harmful application. Jacobi seems to support this view, and despite the fact cited by him that Prudden (*Am. Jour. of the Med. Sci.*, 1881) found that a one-sixth-per-cent. solution suffices to stop the emigration of leucocytes (*loc. cit.*, p. 10).

From time to time, or about once every four hours, it is wise to give the fauces, tonsils, and pharynx a thorough, direct cleansing with this same spray, or by means of a syringe. The local applications with a brush or swab to the back of the throat should be made with a solution of bichloride of mercury (1 to 500, or even 1 to 250). During these necessary manipulations the child should remain in bed or be held on the lap of the nurse and wrapped in a blanket. Dr. Billington thus describes how nasal syringing can best be accomplished: "The assistance of two persons is required. The child is seated across the lap of one of these persons, who secures his hands with one of her own, and with the other holds the basin to receive the discharge. The other person stands behind the child, takes his head between the palms of her hands, and, leaning forward, holds it firmly against her breast. A third person, who should when possible be a physician, can then easily make the injection into the child's nostrils without the danger of injury to them by its sudden movements" (*Diphtheria and Croup*, p. 225). To show how opposed is the experience of competent observers, I would cite Jacobi's judgment, which is that "it is acknowledged as a positive rule among all good practitioners that no child must be taken out of bed for the

purpose of injections, that the preparations for the procedure must be made out of sight, and quickly but gently, in a recumbent or semirecumbent posture" (p. 12). Subsequent to the cleansing and swabbing, the child should be allowed to rest during a half-hour or an hour. Then a dose of the tincture of the sesquichloride of iron in glycerin and water, or a tablet of bichloride of mercury in solution in water or milk, should be given, followed by liquid food and alcoholic stimulant. The amount of the tincture of iron given should be from one to two drops for every year of the child's age; that of mercury in tablet form, from one one-hundredth of a grain to one fiftieth of a grain. The best old brandy, in amount proportionate to the age and condition of asthenia, should be given in milk, alternated occasionally with beef juice or concentrated broths of mutton or chicken. Meanwhile, of course, the antiseptic vapors (referred to under prophylaxis) of turpentine, carbolic acid, and oil of eucalyptus should be kept in use more or less constantly. They must also be directed in such a way from a croup kettle under a hood over the child's head, or a tent around the crib with suitable supports and an opening for ventilation, as to allow the child to inhale the vapors sufficiently to obtain an appreciable medicinal effect in this manner.

I have thus outlined what appears to me the most rational way of treating cases of nasal and pharyngeal diphtheria. It is based upon a judicial estimate of the conditions involved, and with due regard for the knowledge thus far acquired through experimental research and clinical experience. There are many other agents, as we all know, in the nature of caustics, astringents, disinfectants, dyes, solvents, etc., which have been praised by different observers for their curative action in diphtheria. Among them all, none seems to me to merit confidence as much as those already mentioned, especially when they are employed after the manner I have indicated. I find, moreover, that a larger number of practitioners laud their use than they do other agents of a similar or different order. Personally I have had good reason to believe that freshly powdered cubeb has a very marked action in changing favorably the character of the membranous deposit, and in lessening the accompanying catarrhal inflammation of the fauces, which always is allied with the evident diphtheritic manifestations.* I have become

* Even though cubeb has been shown by Dr. W. H. Park to be innocuous to the diphtheria bacillus, it may have important action in helping destroy its poisonous product.

convinced, through personal observations and experience, that the agents employed by some practitioners with considerable faith can not be relied upon as much as those which I have selected and habitually use.

To make applications more frequently to the nasal passages or to the throat than I have advised is unnecessary and often injurious. They frighten and exhaust the child too much. They do not allow it to take and retain sufficient nutriment. If the solutions are made stronger, they are too irritating to be frequently repeated, and perhaps render the mucous membrane of the parts affected more prone to become involved by the encroachment of the disease than they otherwise would be. I have become satisfied latterly that the failure oftentimes to cleanse the nose and naso-pharynx efficiently is one reason why an otherwise good method of treatment is not oftener followed by the amelioration or recovery of the patient. The cleansing of the nasal passage is carried out whenever the presence of diphtheritic membrane in this organ is assured. In cases, however, in which this membrane is not apparent it is too often neglected. It is my belief that absorption of many poisonous products is thus frequently permitted when it might be in part prevented. I am persuaded that many cases become much more serious through the omission referred to. Is it not true that absorption from the nasal passages takes place more readily than from the fauces? Do not the most serious cases usually show extension, sooner or later, of the diphtheritic process to these passages? Why not, therefore, avoid or prevent this grave development, if possible, by rational means? In regard to the frequency of local applications I would again urge very strongly *not* to employ them more frequently than I have advised. Meddlesome or too much interference is ultimately injurious in diphtheria, and mainly because it exhausts vitality and prevents essential recuperation by means of rest, food, and stimulants. Applications of undue strength frequently made to the nasal passages occasion pain and irritation, which increase notably the distress of the patient with no compensating return, and make the membrane, by possible abrasions, more susceptible to the virulence of the disease. Whenever the symptoms point unfortunately toward the involvement of the larynx, we should rely far less upon the utility of disinfecting sprays than in nasal or pharyngeal diphtheria, inasmuch as they penetrate very little or at all within this organ. Antiseptic vapors, the internal use of the medicines which have a favorable constitutional effect, are here more to be trusted. In the event of

considerable laryngeal obstruction, we must make use of vomiting agents—such as turpeth mineral, alum, ipecac—if the child's strength permits, and follow their use with active stimulation. Occasionally false membranes from the larynx are thrown off by this means, and great temporary relief is obtained. At times no remedial effect is produced, and the child is only weakened and distressed to no purpose, for the laryngeal obstruction after their use is quite as great as previously. Under these circumstances we must look to intubation or tracheotomy as our sole remaining means of help.

I have now almost reached the end of my paper. Not that there is not a great deal more that could be said—not that there is not much of the very highest importance to which I have not even referred. But I feel I have taken up sufficient time with my own remarks and opinions, and I desire to hear from others. I would like our discussion to be widely read, widely reported. It is too important in its many aspects of practical and daily moment to all of us to be ignored or laid aside. I for one would be glad to have our laryngological association have the honor and great satisfaction of indicating the road to reforms which must surely come in time, but need to come speedily and for the great advantage of very many people. In order to show how important isolation and disinfection may become in reducing the number of cases of diphtheria and the number of deaths therefrom, I beg leave to make the following citation: "At a meeting of the Michigan Medical Society the secretary demonstrated in a tabulated statement, accompanied with a graphic chart, important facts in the various outbreaks reported by local health officers during the year 1886. In a hundred and two outbreaks in which there was neglect of one or both of these measures the average number of cases to the outbreak was a little over sixteen and the average number of deaths 3·23; while in a hundred and sixteen outbreaks in which both were enforced the average number of cases was 2·86, and that of deaths 0·66. In other words, these simple precautions reduced the number of cases occurring during the year by 1,545 and the number of deaths by 298."*

In conclusion, I can not do better than to take textually from the last published article of Dr. William H. Park, than whom no one deserves more commendation for his admirable scientific work of great and living interest to almost every one. Dr. Park writes

* *New York Medical Journal*, May 21, 1887, page 580—quoted by Billington in his treatise on *Diphtheria and Croup*, page 149.

(*Medical Record*, February 11, 1893; reprint, page 23): "The making of a true diagnosis in every case is not of scientific interest only, but of great practical importance. Care for the public health requires that every case of possible diphtheria be properly isolated and treated as diphtheria until all doubt is removed. Regard for the patient demands that no suspicious case that is not diphtheria be regarded and treated as such any longer than the fourteen hours absolutely necessary for making the diagnosis. In doubtful cases, therefore, it is the duty of physicians to obtain a diagnosis by the use of cultures. A correct diagnosis will also be a satisfaction to them, and will be a help in prognosis and treatment, and of great value in the diagnosing of future cases. The efficiency, simplicity, and cheapness of the methods for making an early diagnosis in doubtful cases would seem to render its employment by health authorities among the poorer classes advisable."

Discussion.

Dr. J. C. Mulhall, of St. Louis: At the last meeting of the association I said something about house posting in the prophylaxis of diphtheria, and that remark gave rise to this proposed discussion. I expressed myself strongly in favor of posting houses, and Dr. Robinson was just as strongly opposed to it. He has, however, said nothing concerning the very point which last year gave birth to this discussion. Looking at the question from this point of view, I should like to relate a case or two of some interest, inasmuch as they have to do with the prophylaxis of diphtheria. In St. Louis a child was taken seriously ill and was attended by a homœopathic physician. It was a case of diphtheria, but, at the request of the members of the family, the physician did not post the house. Some three or four weeks afterward the child appeared on the street with a bandage about the throat. The children in the immediate neighborhood were very glad to see it again, and they interviewed it, etc. The child had a whistle which he allowed the child who lived in the next house to use. This second child contracted diphtheria on the fifth day and died. Three other children in the block, who, as was subsequently learned, also blew into the whistle, were attacked with the disease; all three recovered, one, however, with post-diphtheritic paralysis, which lasted for four or five months. Now, I maintain that had the first house been posted in accordance with the law, the mother of the second child, who is very punctilious, would not have permitted her child to play with the child that was convalescing from diphtheria. The contagion of diphtheria is very seldom portable, for if it were, the disease would be more common than it is in doctors' families. The following, however, is an interesting case, and illustrates that the contagion of the

disease may be carried by the patient for three or four weeks after convalescence: An Indian child was taken with diphtheria in St. Louis, involving the nose, larynx, and pharynx. It recovered after intubation. I was the consulting physician. Dr. William Barker succeeded in saving this child's life. During the third week of convalescence the child was sent to the home of its parents in North Topeka. The parents had a little farm four miles from North Topeka. There was no diphtheria in Topeka—and certainly none in the country four miles from its suburb, North Topeka. This Indian child took with her a doll with which she had played during her illness. On the fourth day after her return home her sister, aged four years, was attacked with diphtheria, and died with that disease after five days. This goes to show the portability of the disease by the patient or its playthings. As Dr. Robinson said in his paper, the bacilli may be found in the throat five weeks after the membrane has disappeared.

Prophylaxis by means of disinfection has more reference to the children themselves than to their surroundings. I am perfectly in accord with Dr. Robinson that sulphur fumigations have no effect whatever in stemming the contagion. I have seen houses fumigated in this way after the occurrence there of diphtheria, and two months afterward treated other cases of the disease in the same house. Even with the aid of vapor, sulphur fumigations can not prevent the recurrence of the disease in a house.

It is true that the attendants in the sick-room do sometimes acquire diphtheria. In one case two children had diphtheria and recovered, and their father, who had nursed them, was then attacked with it and died in three days. The personal prophylaxis of children consists, therefore, in not allowing them to associate with or go near any child within five or ten weeks after it has recovered from the disease. The condition of the soil, the condition of the throat, has everything to do with the question of whether a child shall become diphtheritic or not. The personal prophylaxis is very important. Children with good hygienic surroundings and whose mucous membranes are in a perfectly tonic condition seldom acquire diphtheria or any other contagious disease. Children with enlarged tonsils are the ones who usually contract the disease.

As to the attire of the physician who enters the sick-room, I do not think this point is of such great importance, as it has been proved that diphtheria is seldom carried by the doctor. Why then attire ourselves in this armor? I know of one physician who, when he enters the sick-room, always puts on a rain coat and a skull-cap and disinfects his hands afterward. He has a heavy mustache, but this he never disinfects or shampoos after leaving the room, which is not consistent with his other precautions, as I think the hairs are more likely than anything else to carry the contagion.

As to treatment: I wrote a paper about five years ago in which I stated that, as far as my experience went, there were two things to be

attended to. One was to sterilize the upper air passages, and the other was to maintain the nutrition of the child. Beyond these two measures I had very little faith in anything else, including drugs. I maintained then that it was a mistake to irritate the child by constantly cleaning the throat. It makes a great difference whether the child is a well-disciplined or a spoiled child. If you have to deal with a child that shrinks and fights when you ask it to show its tongue, there is not much use in direct personal disinfection, because the constant struggle causes more harm than you can do good by attempting to sterilize the upper air passages. I showed that the gentlest way of doing this was by means of a common household syringe. This is done by removing the hard rubber point from the syringe, have the child lie on one side, introduce the point of the syringe into the pharynx, and wash as hard as you please; not a single drop enters the larynx. It is prevented by the reflex movement of the base of the tongue. I also introduced a nasal syringe for the purpose of cleaning the nares in diphtheria; the opening of this syringe was very large, so that it was impossible to throw a violent stream. I endeavored to show the importance of disinfecting the posterior nares, on account of the plentiful distribution of the lymphatic tissues in that location, and the consequent great danger of the rapid absorption of ptomaines. This can not be done by means of sprays or the household syringe, because of the contraction of the soft palate. I prefer the compound solution of iodine, variously diluted, to any other remedy for cleansing purposes. I desire to pay tribute to Dr. Park, of New York, for his grand investigations of this subject. He informs us that it takes fourteen hours to positively determine the presence or absence of the Klebs Loeffler bacilli in the exudate. It seems to me that until the diagnosis is positive, all cases at all suspicious should be treated as diphtheria. If it proves to be something else, we have done no harm.

BUSINESS MEETINGS.

The Fifteenth Annual Congress of the American Laryngological Association was held in the city of New York, May 22, 23, and 24, 1893. The following members were present:

M. J. Asch, New York, President.
S. Johnston, Baltimore, First Vice-President.
J. C. Mulhall, St. Louis, Second Vice-President.
Charles H. Knight, New York, Secretary and Treasurer.
D. Bryson Delavan, New York, Member of Council.
Harrison Allen, Philadelphia, Member of Council.
W. C. Glasgow, St. Louis, Member of Council.
S. W. Langmaid, Boston, Member of Council.
F. H. Bosworth, New York.
J. H. Bryan, Washington.
W. E. Casselberry, St. Louis.
S. H. Chapman, New Haven.
J. Solis-Cohen, Philadelphia.
T. A. DeBlois, Boston.
J. W. Farlow, Boston.
T. R. French, Brooklyn.
J. W. Gleitsmann, New York.
U. G. Hitchcock, New York.
F. L. Ives, New York.
F. I. Knight, Boston.
G. M. Lefferts, New York.
R. P. Lincoln, New York.
J. N. Mackenzie, Baltimore.
W. Peyre Porcher, Charleston.
C. C. Rice, New York.
Beverly Robinson, New York.
J. O. Roe, Rochester.
E. L. Shurly, Detroit.
W. K. Simpson, New York.
H. L. Swain, New Haven.
A. B. Thrasher, Cincinnati.
S. O. Vander Poel, New York.
Clinton Wagner, New York.
A. W. Watson, Philadelphia.
J. Wright, Brooklyn.

After the calling of the roll the President's address was delivered by Dr. Asch. At the conclusion of the first morning session the following candidates were elected to fellowship in the Association as active Fellows:

H. S. Birkett, M. D., Montreal, Canada. Thesis: A Case of Subchordal Spindle-celled Sarcoma and its Successful Removal by Thyrotomy.

A. A. Bliss, M. D., Philadelphia. Thesis: The Importance of Certain Abnormities of the Upper Air Tract observed frequently in Deaf-Mutes.

A. Coolidge, Jr., M. D., Boston. Thesis: Spurs of the Cartilaginous Septum.

George B. Hope, M. D., New York. Thesis: The Use and Abuse of the Galvano-cautery in Nasal and Pharyngeal Conditions.

James E. Newcomb, M. D., New York. Thesis: Electrolysis for the Removal of Certain Morbid Conditions of the Nasal Septum.

A. W. de Roaldes, M. D., New Orleans. Thesis: Cases of Epistaxis of Grippal Origin and Dangers attending Post-nasal Plugging.

Charles M. Shields, M. D., Richmond. Thesis: Hyperæsthetic Rhinitis.

And as Corresponding Fellow, C. M. Desvernine, M. D., Havana, Cuba.

Dr. J. W. Farlow and Dr. W. K. Simpson were appointed a committee to audit the Treasurer's accounts.

At the business meeting on the morning of the second day of the Congress the reports of the Secretary and of the Treasurer were presented.

The library having been transferred to the Surgeon General's Office and the position of Librarian of the Association being vacant, no report on the library was offered.

Secretary's Report.

The Secretary announces with regret the death, since our last meeting, of Franklin H. Hooper, of Boston, elected an active Fellow of the Association in 1882.

The resignation of Edgar Holden, of Newark, elected an active Fellow in 1879, is herewith presented.

The fourteenth volume of *Transactions*, comprising the proceedings of the meeting held in Boston in 1892, has been completed and distributed. The Secretary would invite suggestions as to a remedy for the annoying delay in the publication of our transactions.

A meeting of the Council was held in New York on March 18, 1893, the minutes of which will now be read.

Treasurer's Report.

THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

In Account with Charles H. Knight, Treasurer.

Receipts.

Brought from 1892 account . . .	$246 95	
Cash, annual dinner	100 00	
Dues	265 00	
Sale of *Transactions*	57 00	
		$668 95

Expenditures.

Cong. Phys. and Surg., 1891	$28 42	
Stenographer, 1892	69 00	
Annual dinner, 1892	101 25	
Rent of hall, 1892	28 00	
Transactions, 1891	264 78	
Delivering *Transactions*, 1891, 1892	27 34	
Postage on programmes, etc.	12 48	
Printing, M. J. Rooney	47 75	
Printing, D. Appleton (Constitution and By-laws)	4 50	
		$583 52
Balance to credit		$85 43

J. W. Farlow, W. K. Simpson, } *Auditing Committee.*

Under miscellaneous business it was voted that the selection of speakers and of subjects to be discussed during the time assigned to this Association at the Congress of Physicians and Surgeons in 1894 be referred to the Council with power.

The Secretary read a communication from the Secretary General of the International Medical Congress requesting the appointment of delegates from this Association to the Congress.

On motion, Dr. George M. Lefferts was elected a delegate, and the appointment of others was referred to the Council with power.

The President appointed Dr. F. I. Knight, Dr. J. Solis-Cohen, and Dr. Delavan a committee to draft resolutions of respect to the memory of our late associate, Dr. F. H. Hooper.

The amendment of the Constitution proposed by Dr. F. I. Knight, providing for election at the first session of a Nominating Committee, who shall report at the business meeting on the second day, was put to vote, after full discussion, and was unanimously carried.

A proposed amendment of the By-laws, providing for an increase in the annual dues, was lost, but the Treasurer's accounts showing an insufficient surplus, it was voted to levy an extra assessment of five dollars.

At the conclusion of the scientific proceedings on the third day of the Congress, the Association went into executive session and elected the following officers, all of whom had been duly nominated:

President.—D. Bryson Delavan, New York.

First Vice-President.—J. C. Mulhall, St. Louis.

Second Vice-President.—W. E. Casselberry, Chicago.

Secretary and Treasurer.—C. H. Knight, New York.

Librarian.—J. H. Bryan, Washington.

Member of Council.—M. J. Asch, New York.

The newly elected President having taken the chair, after a vote of thanks to the resident Fellows, to the Academy of Medicine for the use of the hall, and to the Secretary, the Congress adjourned.

OBITUARY.

Franklin H. Hooper, M. D.

No history of the subject of adenoids in the vault of the pharynx will be complete without a reference to the conscientious and thorough work in this line of our lamented colleague, Hooper. He may be said to have been the pioneer in this country in investigating this interesting lesion. His contributions to the pathology, the diagnosis and the treatment of this condition will always have a scientific and practical value. His labors in connection with the deliberations of this association, however, were in quite another field, but were no less important. His candidate's thesis, which introduced him to the association at the Boston meeting in 1882, was entitled "On the Treatment and Recurrence of Papilloma of the Larynx." The subject of his paper, read before the association the following year, was "Experimental Researches on the Tension of the Vocal Bands." The latter topic, and questions related to it, engaged his zealous attention for many years, and it is impossible to forget the earnestness and conviction with which he was in the habit of maintaining his favorite views. There was no suspicion of doubt or uncertainty in his mode of expression, because his conclusions were based on long and patient study. At the same time and whatever the warmth of debate he never overstepped the bounds of courtesy. His genial, kindly disposition tempered the heat of discussion and excluded all bitterness from possible difference of opinion. By those who had the fortune of a personal intimacy with him he will be long remembered for those characteristics of mind and heart which make a man a reliable adviser and a trusty friend.

Dr. Hooper was born in Boston, September 19, 1850. He graduated at the Harvard Medical School in 1876. He afterward spent some time in study abroad, devoting especial attention to diseases of the larynx at the clinics of Vienna and Paris. On his return to Boston he began active practice and promptly took a position in the first rank. He became an acknowledged authority in diseases of the upper air-passages. He was appointed physician to out patients in the throat department of the Massachusetts General Hospital, a position which he held until his death. He was afterward called to a similar appointment at the Boston City Hospital and was prominent in securing the efficient equipment and arrangement of that institution. He was also made an aurist at the Boston Dispensary. Subsequently he was called to the professorship of laryngology at Dartmouth College, and also became instructor in that branch at the Harvard Medical School. He was one of the founders of the American Climatological Association, but retained his membership only a few years. He served in the council of the American Laryngological Association from 1887 to 1890. In the autumn of 1891 epithelial growths first appeared on his tongue, premonitory symptoms in the shape of leucomatous

patches having been present since 1884. A portion of the tongue was removed, but the disease recurred in the glands of the neck and rapidly extended. The long and painful illness, which ended fatally on November 22, 1892, was the cause of Dr. Hooper's absence from the fourteenth annual meeting of the association, held in Boston, where he would naturally have been a conspicuous figure. Regret and sympathy were universally expressed by the fellows present.

We contemplate such a career as his with mingled feelings. The loss of one possessed of such attractiveness of person and charm of character is not to be repaired. In science he had accomplished much, and would doubtless have done much more had he survived. The spectacle of a man looking forward with calmness and even cheerfulness to an inevitable fate, such as he must long have known to be involved in the malady from which he suffered, inspires us with awe and admiration. The tribute to his memory offered by his associates is prompted by the keenest appreciation and the warmest affection. (C. H. K.)

Resolutions on the Death of Dr. Franklin H. Hooper.

The committee appointed at the Fifteenth Annual Meeting of the American Laryngological Association, held in the city of New York, May, 1893, to draft resolutions to the memory of Dr. Hooper report as follows:

Whereas, During the past year this association has suffered the loss of one of its Fellows, Dr. Franklin H. Hooper, who has been removed from the midst of a career of extraordinary usefulness and success; therefore, be it

Resolved, That the death of Dr. Hooper has taken from this association one of its most gifted and valuable members, a man of broad experience and liberal culture; of lofty character, genial disposition, and unexampled courage; of rare skill, originality, and enthusiasm as a scientific practitioner; a physician actuated by the noblest ambitions, to whom success in relieving human suffering was granted in marked degree.

Resolved, That while overcome by a deep sense of the personal loss which we have sustained, we are mindful that the world at large has been deprived of one who as physician, teacher, and original investigator had attained the highest position while yet at the threshold of middle life, a loss at once deplorable to his friends, his profession, and his country.

Resolved, That these resolutions be published in the *Transactions* of the association, and that a copy of them be sent to the family of Dr. Hooper.

Frederick I. Knight,
J. Solis-Cohen,
D. Bryson Delavan,
Committee.

1894.

ACTIVE FELLOWS.

Allen, Harrison, 1933 Chestnut Street, Philadelphia, Pa.
Asch, Morris J., 5 West Thirtieth Street, New York.
Bean, C. E., Germania Life Building, St. Paul, Minn.
Birkett, Herbert S., 123 Stanley Street, Montreal.
Bliss, Arthur Ames, 1832 Race Street, Philadelphia, Pa.
Bosworth, Francke H., 26 West Forty-sixth Street, New York.
Brown, M. R., 34 Washington Street, Chicago, Ill.
Bryan, J. H., 806 Seventeenth Street, Washington, D. C.
Casselberry, William E., 34 Washington Street, Chicago, Ill.
Chapman, S. H., 193 Church Street, New Haven, Conn.
Cohen, J. Solis-, 1431 Walnut Street, Philadelphia, Pa.
Cohen, S. Solis-, 219 South Seventeenth Street, Philadelphia, Pa.
Coolidge, A. Jr., 1 Exeter Street, Boston, Mass.
Daly, William H., 135 Fifth Avenue, Pittsburg, Pa.
DeBlois, T. Amory, 372 Marlborough Street, Boston, Mass.
Delavan, D. Bryson, 1 East Thirty-third Street, New York.
Farlow, J. W., 234 Clarendon Street, Boston, Mass.
French, Thomas R., 150 Joralemon Street, Brooklyn, N. Y.
Glasgow, William C., 2847 Washington Avenue, St. Louis, Mo.
Gleitsmann, J. W., 46 East Twenty-fifth Street, New York.
Hartman, J. H., 5 West Franklin Street, Baltimore, Md.
Hinkel, F. Whitehill, 305 Delaware Avenue, Buffalo, N. Y.
Hitchcock, Urban G., 51 West Twenty-ninth Street, New York.
Hope, George B., 34 West Fifty first Street, New York.
Ingals, E. Fletcher, 36 Washington Street, Chicago, Ill.
Ives, Frank L., 117 East Thirtieth Street, New York.
Jarvis, William C., 142 Madison Avenue, New York.
Johnston, Samuel, 204 West Monument Street, Baltimore, Md.
Knight, Charles H., 20 West Thirty-first Street, New York.
Knight, Frederick I., 195 Beacon Street, Boston, Mass.
Langmaid, Samuel W., 373 Boylston Street, Boston, Mass.
Lefferts, George Morewood, 6 West Thirty-third Street, New York.

Lincoln, Rufus P., 22 West Thirty-first Street, New York.
Lowman, John H., 441 Prospect Street, Cleveland, O.
MacCoy, Alexander W., 1417 Walnut Street, Philadelphia, Pa.
Mackenzie, John N., 605 North Charles Street, Baltimore, Md.
Major, George W., 82 Union Avenue, Montreal.
Mulhall, J. C., 3609 Lindell Avenue, St. Louis, Mo.
Murray, T. Morris, Seventeenth and H Streets, Washington, D. C.
Newcomb, James E., 118 West Sixty-ninth Street, New York
Porcher, W. Peyre, 4 George Street, Charleston, S. C.
Porter, William, 2830 Locust Street, St. Louis, Mo.
Rankin, D. N., 85 Lincoln Avenue, Allegheny, Pa.
Rice, Clarence C., 123 East Nineteenth Street, New York.
Roaldes, A. W. de, 136 Gravier Street, New Orleans, La.
Robinson, Beverley, 37 West Thirty-fifth Street, New York.
Roe, John O., 28 North Clinton Street, Rochester, N. Y.
Sajous, Charles E., 1630 Chestnut Street, Philadelphia, Pa.
Seiler, Carl, 1204 Walnut Street, Philadelphia, Pa.
Shields, Charles M., Fifth and Franklin Streets, Richmond, Va.
Shurly, E. L., 25 Washington Avenue, Detroit, Mich.
Simpson, W. K., 952 Lexington Avenue, New York.
Swain, H. L., 238 York Street, New Haven, Conn.
Thrasher, A. B., 159 West Ninth Street, Cincinnati, O.
Van der Poel, S. Oakley, 47 East Twenty-fifth Street, New York.
Wagner, Clinton, 19 East Thirty-eighth Street, New York.
Wagner, Henry L., 506 Sutter Street, San Francisco, Cal.
Watson, A. W., 162 North Twentieth Street, Philadelphia, Pa.
Wright, Jonathan, 73 Remsen Street, Brooklyn, N. Y.

HONORARY FELLOWS.

Garcia, Manuel, 1 Bentinck Street, Manchester Square, London, England.
* Mackenzie, Sir Morell, 19 Harley Street, W., London, England.

CORRESPONDING FELLOWS.

Browne, Lennox, 36 Weymouth Street, London, England.
De La Sota y Lastra, R., 7 Calle de Torqueros, Seville, Spain.
Desvernine, C. M., Cuba 52, Havana, Cuba.
Gouguenheim, A., 73 Boul. Hausmann, Paris, France.

* Deceased.

Krause, H., Neustädt. Kirch-Strasse 13, Berlin, Germany.

Labus, Carlo, Via St. Andrea 8, Milan, Italy.

Massei, F., 4 Piazza Municipio, Naples, Italy.

Meyer, Wilhelm, Nörrefarimagsgade 19, Copenhagen, Denmark.

Moure, E. J., 25 Cour du Jardin-Public, Bordeaux, France.

Schroetter, Leopold v., Schwartzenberg-Strasse 8, Vienna, Austria.

Semon, Felix, 39 Wimpole Street, Cavendish Square, London, England.

Stoerk, Carl, Wallfischgasse 13, Vienna, Austria.

Whistler, W. McNeil, 28 Wimpole Street, Cavendish Square, London, England.

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